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CONTENTS.

Tenth Report of the Variable Star Section, 1920-1924.

FELIX DE ROY, Director.

		Page
PREFACE,		vii.
INTRODUCTION BY PROFESSOR H. H. TURNER, F.R.S.,		xxx.
THE OBSERVATIONS:—		
R	Andromedæ	1
W	,,	7
R	Aquilæ	15
S	,,	24
R	Arietis	33
R	Aurigæ	40
X	,,	48
R	Boötis	56
S	,,	64
U	,,	73
V	,,	79
R	Camelopardalis	90
V	,,	99
X	,,	104
R	Cassiopeiæ	114
S	,,	123
T	,,	127
W	,,	137
S	Cephei	146
T	,,	149
o	(Mira) Ceti	160
S	Coronæ	171
W	,,	180
χ	Cygni	186
R	,,	201
S	,,	207
V	,,	209
W	,,	217
R	Draconis	230
T	,,	243
R	Geminorum	244
S	Herculis	252
T	,,	259
U	,,	268
R	Hydræ	274
R	Leonis	280
R	Lyncis	289
W	Lyræ	296

THE OBSERVATIONS—*continued.* Page

RY Ophiuchi	305
U Orionis	311
R Pegasi	317
X ,,	323
R Persei	328
R Serpentis	331
V Tauri	339
R Ursæ Majoris	345
S ,, ,,	355
T ,, ,,	368
S Ursæ Minoris	378
S Virginis	387
R Vulpeculæ	392

Stars arranged in Order of Right Ascension.

Harvard Designation.	Chandler's Number.	Name.	Page
001755	107	T Cassiopeiæ	127
001838	112	R Andromedæ	1
004958	294	W Cassiopeiæ	137
011272	432	S ,,	123
021024	782	R Arietis	33
021143a	787	W Andromedæ	7
021403	806	o (Mira) Ceti	160
032335	1222	R Persei	328
043274	1637	X Camelopardalis	104
044617	1717	V Tauri	339
050953	1855	R Aurigæ	40
054920	2100	U Orionis	311
054974	2096	V Camelopardalis	99
060450	2186	X Aurigæ	48
065355	2478	R Lyncis	289
070122a	2528	R Geminorum	244
094211	3493	R Leonis	280
103769	3825	R Ursæ Majoris	345
123160	4511	T ,, ,,	368
123961	4557	S ,, ,,	355
132422	4826	R Hydræ	274
132706	4847	S Virginis	387
141954	5157	S Boötis	64
142584	5190	R Camelopardalis	90
142539	5194	V Boötis	79
143227	5237	R ,,	56
144918	5338	U ,,	73
151731	5504	S Coronæ	171

Stars arranged in Order of Right Ascension (*contd.*).

Harvard Designation.	Chandler's Number.	Name.	Page
153378	5601	S Ursæ Minoris	378
154615	5677	R Serpentis	331
161138	5832	W Coronæ	180
162119	5889	U Herculis	268
163266	5955	R Draconis	230
164715	6044	S Herculis	252
175458a	6449	T Draconis	243
180531	6512	T Herculis	259
181136	6549	W Lyræ	296
181103	6550	RY Ophiuchi	305
190108	6849	R Aquilæ	15
193449	7045	R Cygni	201
194632	7120	χ ,,	186
200357	7220	S ,,	207
200715a	7242	S Aquilæ	24
203847	7428	V Cygni	209
205923	7560	R Vulpeculæ	392
210868	7609	T Cephei	149
211614	7658	X Pegasi	323
213244	7754	W Cygni	217
213678	7779	S Cephei	146
230110	8290	R Pegasi	317
235350	8600	R Cassiopeiæ	114

SECTION FOR THE OBSERVATION

OF

VARIABLE STARS.

DIRECTOR—FELIX DE ROY.

TENTH REPORT OF THE SECTION, 1920-1924.

PREFACE.

MODERN research has considerably added, of late, to the astrophysical significance of Long Period Variable Stars.

There is now fairly general agreement that these bodies, the first known, and brightest of which, *o* (Mira) Ceti, was discovered in 1638 by the Frisian astronomer Jan FOKKER (Phocylides HOLWARDA), represent the earliest stage in the luminous career of many, if not all stars.

They are "red giants" of enormous dimensions, high luminosity, comparatively small mass, and exceedingly low density; in fact, vast aggregations of nothingness, the extraordinary variations in the light of which are due, not so much to their changing energy output as to the fact that the latter takes place at extremely low effective temperatures—low, that is, as compared with the temperature of most other stars, viz., something like 2000 degrees Centigrade, absolute.

It appears that Long Period Variables have climbed up the evolutionary ladder exactly high enough to begin to shine forth. "They are the youth of the skies, just stepping upon the threshold of celestial splendours; from the darkness of space they have suddenly emerged to take up their light-giving activities for billions of years" (A. H. JOY). Long Period Variables therefore would seem to be the master key to the problem of stellar development. We shall doubtless learn from them some day "how stars are born."

It is just possible that these assumptions are somewhat too broad, and that they do not apply to all Variable Stars having periods from 90 to over 600 days, which are commonly described as "Long Periods," for length of period alone is not a suitable criterion by which to define the type of variation from a physical point of view. They should possibly be restricted to the *Me* stars, *i.e.*, to Variables of the spectral type M which show bright emission lines, the high residual velocities of which seem to indicate that they form a group moving somewhat like an "open cluster" in space; to the *Se* type Variables which are closely allied to the *Me* stars* ; and to the few R and N Long Periods, most of which show bright hydrogen lines. According to Hufker, a large percentage of the red giants are slightly variable, and it is quite possible that variation of small range and very long period is common for this class of stars.

Even, however, when we restrict typical long period variation in this way, we are still completely in the dark as to the *inner* cause or causes which periodically affect the quantity and quality of the light being sent out into space. The chief difficulty in this respect is to explain how bright emission lines requiring the strongest excitation and exhibiting quite abnormal structure and distribution of intensity, can appear in the spectrum of such low temperature stars, being completely absent at, or shortly after minimum, and generally appearing brightest some time after the maximum of the light variation. As Svein Rosseland puts it: "When it is a question of accounting for the presence of hydrogen lines in giant M stars, thermodynamical theory seems to break down." Alternative theories are suggested, such as emission of radiation at a rate independent of temperature, but their application to our problem presents great, and almost insuperable difficulties.

We are somewhat better, although far from completely informed as regards the processes which underlie the mechanism of the long period variation.

It is known from the spectrum of Long Period Variables that it is possible for molecules of titanium oxide (zirconium oxide in the case of the *Se* stars) to form in their upper atmosphere, where the temperature may be as low as 1600 degrees Centigrade, absolute. These molecules would absorb light from the interior, and develop some sort of veil or screen, which would temporarily reduce the magnitude of the star, at the same time, however, allowing it to store up heat. This, after some time, might partly dissociate the compounds, the light would therefore brighten, and the cycle would begin again through the progressive cooling down of the higher strata (Merrill, Hopmann). This titanium oxide "screening" would account for about two magnitudes in the visual range of Mira Ceti.

* There are differences, however. The bulk of the *Me* Variables are concentrated towards Sagittarius, in the third and fourth quadrants of the Milky Way, and about galactic latitude 20° (H. Shapley and A. J. Cannon). The 30 known *Se* Variables, though also concentrated towards the galactic equator, between +35° and −25°, show an entirely opposite and rather remarkable distribution in longitude, 25 of them having longitudes between 30° and 175°, and the few others clustering round the Galactic Centre. This strong asymmetry is shared by 7 out of 10 non-variable S stars of P. W. Merrill's list, 1927 (De Roy).

According to recent research, the rest of the visual variation might well be ascribed to that periodical expansion and contraction of the atmosphere of a star which takes place under the opposing forces of gravitation and gaseous elasticity, and has been called "pulsation."

When, in 1914, he first propounded the pulsation hypothesis to explain the changes of light of the Cepheid Variables (which are yellow, more massive, more dense, and probably somewhat more luminous giants with shorter periods and smaller visual ranges), Harlow SHAPLEY suggested that the Long Period Variables are intimately related to the Cepheids. Their "later" spectra and longer periods were noted as forming extensions to the series of spectra and periods for Cepheids, while both types present many common characteristics, such as variability of spectrum and colour, form of light curve and its frequent instability, occasional inconstancy of period, and high luminosity.

These views, which, at the time, attracted little attention, have been well borne out by later theoretical and observational research. G. LEMAITRE, when at Harvard in 1925, tentatively applied the pulsation theory to Long Period Variables on the lines of the radiative equilibrium theory of a star developed by A. S. EDDINGTON, and found a mean effective temperature of 1700 degrees for a M*d* Variable with a period of 400 days, which he estimated "probably a little too low." Starting from the assumptions that the median total luminosity of periodic Variable Stars follows the observed mass-luminosity law, and that the variation of any given type arises from a dynamical oscillation of some definite sort, H. N. RUSSELL (1927) concludes that if long period variation is due to such an oscillation, "the relation between period and density, in its case, may be much the same as for Cepheids." Eddington himself had already considered that some sort of pulsation may underlie long period variation, and that it may differ from Cepheid variation only as required by the different densities and masses of the two classes of stars. He had found, for example, that the known dimensions of Mira Ceti can be quite well adapted to a pulsation period of 300 days, which is not far from the mean period deduced from the light curve. In J. H. JEANS' theory of incipient fission also, which may be considered as a compromise between the pulsation and the double star theory for Cepheids, there is nothing inconsistent with the hypothesis of a close relation between these objects and the typical Long Periods.

Fairly convincing evidence of more or less strong interrelations between the two classes, and, more generally, between most types of Variable Stars, has been given by CHANDLER, HAGEN, TURNER, NIELSEN, GÜSSOW, THOMAS, and especially by H. LUDENDORFF, chiefly from considerations regarding their periods, amplitudes, light curves, spectra, velocities, and distribution in the sky.

The most serious objection, from an observational point of view, to the idea that Long Period Variables could be subject to pulsation was possibly the circumstance that, unlike the Cepheids, their radial velocity proper, *i.e.*, deduced from their absorption lines, was thought to be constant, or subject only to minor and erratic fluctuations. A. H. JOY, however, has removed this difficulty by proving in 1926,

in a discussion of 131 spectrograms taken with the powerful Mount Wilson telscopes and covering, for the first time, the whole range of the variation of Mira Ceti, that this view was erroneous. The outer atmosphere of this star shows a small (12 km/s.) but quite distinct variation in velocity which is closely related to the variation in light. There is little doubt that Long Periods are not spectroscopic binaries. "If the velocity curve shown by the absorption lines can be interpreted as a spherical pulsation of the star, it would mean a considerable change in the size of the disk, and a corresponding variation of the total luminosity." This periodic variation in size due to contraction and expansion of the atmosphere would amount perhaps to 11 per cent. or 26 million km., about a mean position, and would be comparable with the relative change found for Cepheids. Joy concludes that the physical changes may be traced to sources similar to those prevailing in the hotter Variables, and that the whole group of physical Variables [as opposed to the "optical" Variables, Algolids and possibly some Irregulars] may be found to form a sequence from the shortest to the longest periods.

The pioneer work of Paul W. Merrill has shown that the behaviour of the spectrum of Mira Ceti and its relation to change in brightness are typical of the *Me* Long Period Variables. As far as we know at present, these may therefore well be considered as stars subject to slow and fairly regular internal pulsations, or dynamical oscillations, which appear to be more or less masked by absorption. The latter would produce the bulk of the irregularities so noticeable in the light curves of this class of objects. As to the sudden changes or "discontinuities" in the length of the period, discovered by Turner, their physical interpretation is obviously very difficult.

The probability of an intimate relationship between Cepheids and Long Periods has been strengthened by recent work on the absolute magnitude, or "candle power" of the latter. Some years ago, it was thought to be not higher than 0·0, or possibly −0·5 (Adams & Joy) at maximum. Oort, however, had obtained a value 2 magnitudes brighter, from the motions. A few months ago, B. P. Gerasimovič, from all available proper motions and radial velocity data, derived the high value of −2·3 for the objects of this class having the shortest periods (100 to 250 days), and this result is supported by Shapley's preliminary studies in Milky Way Field 185. This higher value would lessen the abnormality of the absolute magnitude of the B8 (?) dwarf companion of Mira Ceti (+6·0).

In addition, Gerasimovič's systematic work on the RV Tauri type Variables makes it almost certain that this class represents a link between Cepheids and Long Periods. The variable velocity of the brightest of them, R Scuti, was established by Curtiss two years before the same phenomenon was definitely ascertained for Mira Ceti. Axel V. Nielsen shrewdly remarks that the small number of known stars of this intermediate type may be due to the fact that the evolution from one to the other is possibly comparatively rapid.

The discovery that "the light variation of the Cluster Variables, the classical Cepheids, and the Long Period Variables represent different

forms of the same physical phenomenon" (SHAPLEY) is of the greatest importance. The relation of the period of the Cepheids to their luminosity has already given us a useful means of fathoming the depths of the Universe. If a satisfactory period-luminosity curve could be constructed for Long Period Variables, which are much more numerous and better distributed than the limited class of Cepheids, a new and powerful instrument would have been devised for the study of the "construction of the heavens."

The problem is far from being a simple one and presents many difficulties. The redistribution of light by the absorption bands in Long Period Variables is probably influencing the changes in their absolute magnitude; the relations between radial velocity and change in light seem to be quite the reverse of each other in Long Periods and in Cepheids; the relations between visual, photometric, and bolometric or radiometric magnitudes are different. Apparently, the law connecting luminosity—which is the clue to distance—and the other physical characteristics of Long Period Variables is more complicated than happens to be the case with Cepheids. Nevertheless, steady progress is being made in this direction. Already a satisfactory period-spectrum curve has been recently produced at Harvard for 98 Cepheids and 438 Long Periods, some RV Tauri type stars conforming fairly well with the scheme. This means that, as soon as the mean period of a Long Period is known, however faint it may be, its spectrum may be fairly safely inferred from the period-spectrum curve. The spectrum will then give the approximate absolute magnitude; and the comparison between apparent and absolute magnitude, a clue as to the parallax or distance. A procedure of this kind is being applied by Harlow SHAPLEY in his studies of the Galactic Centre, which have already given preliminary indication of a massive galactic nucleus. Long Period Variables are thus entering the arsenal of statistical astrophysics.

Coming research will therefore tend to increase the statistical material on Long Periods, and to stimulate fresh discoveries of still fainter and more remote objects. Such discoveries are accumulating at a quick and progressive rate. Only three of these objects were known at the beginning of the XIXth century. When ARGELANDER opened a new era in the study of Variable Stars, his celebrated *Aufforderung* (1844) mentioned nine Long Periods. About forty years later, their number had grown to 128 (CHANDLER'S first *Catalogue*, 1888). Photography then made its appearance in this field of research, and, especially in the hands of the HARVARD observers, it yielded most valuable results; the latest compendium of these objects, the *Harvard Catalogue of Long Period Variable Stars*, by S. D. TOWNLEY, A. J. CANNON and Leon CAMPBELL (1928) which, it may be remarked, is the first of its kind, includes 1760 stars, of which about 50 are not typical Long Periods. For 59% of the total, periods have been determined; for 33% the spectrum has been photographed, while for 27% only, some 475 stars, is the light curve sufficiently well known to make the derivation of the mean value of the interval of time between maximum and minimum (M—*m*) possible.

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A plan is now being carried out at Harvard whereby 240 photographic fields, chiefly distributed along the Milky Way, are being

systematically investigated for faint Variables. Since this observing programme began, more than 1300 of these objects, most of which are fainter than the eleventh magnitude at maximum, have already been found, and it is estimated that the whole scheme will reveal possibly one or two thousand new Long Periods.

Although this work is of the highest importance from the point of view of statistics, distance and shape of the outer parts of our Galactic system, and cosmogony, it is doubtful whether it will ever be possible to get more than a rough outline of the variations of the large numbers of new Long Periods thus discovered. The wonderful Harvard collection of celestial photographs may yield more or less well connected epochs of maxima, and mean photographic light curves for all Long Periods brighter than 14^m at minimum, and steps have been recently taken, partly through voluntary help from outside, to promote the investigation of this wealth of material.

All in all, however, it is estimated that not more than 400, and certainly less than 500 Long Periods are, at the present time, sufficiently well followed by *all* the observers in the world to permit of a satisfactory and continuous representation of the whole of their light changes, including the faint minima many of them are exhibiting. Very likely, the number of really *well* observed Variables is still smaller.

The question therefore arises whether, while increasing the observational effort in order to follow as many objects as possible, especially the brightest with known periods which are not now under visual observation, it will not be necessary, sooner or later, to concentrate upon a selected list of well distributed and carefully selected Long Periods, fairly representative of their various sub-classes, and to observe these chosen stars with special care, in order to be able to study closely all the peculiarities of their vagaries—following in fact a somewhat similar procedure to that adopted in astronomy of position, which, while engaged in the determination of their position in the sky of ever fainter and fainter objects, is observing with special zeal and care a limited number of fundamental "clock stars."

OUR WORKING LIST.

The activities of the Variable Star Section of the British Astronomical Association, founded in 1890, to some extent approximate to such a plan. They have more and more tended to the close and thorough observation of a limited number of Long Period Variables, which experience has shown to be, together with some Irregular Variables, most suitable for the instrumental equipment and opportunities of the average non-professional astronomer.

From 24 in 1899, the number of Long Periods under observation by the Section had been increased to 29 in 1910, and to 36 in 1915, while the present Memoir includes observations of 51 objects of this type, chiefly made in 1920-24, or about one-tenth of the number of well observed Long Periods.

The list of these 51 stars will be found on pp. iii.-v.

They are the same as those contained in the *Ninth Report* of the Section (*Mem. B.A.A.*, Vol. XXV, 1924), with 15 additional stars. Of the latter, eight, namely S Aquilæ, S and U Boötis, R Camelopardalis, W Cassiopeiæ, V Cygni, U Herculis, and V Tauri, were observed before 1920, but the observations, included in this volume, were left unpublished. Work upon the remainder, S and T Cassiopeiæ, S Cephei, S Cygni, T Draconis, R Lyncis, and R Persei, was begun during the years 1920-1924. In addition to the 15 stars just named, the Long Period Variable U Cygni has been regularly observed, and the observations entrusted to Dr. J. van der Bilt, of the University Observatory, Utrecht, for discussion, and publication in Holland. They have therefore been omitted from the present Memoir.

The formation of this Working List of 52 Long Periods has not been systematic. The first two score stars were chosen chiefly for their brightness at maximum, which quite naturally commended them to amateurs with small or moderate optical means; they therefore included most of the "oldest" Variables. Subsequent additions were made with a view to interesting peculiarities, such as exceptional shortness or length of period, and the position in the sky of stars selected. Lastly, the seven Variables added by the present Director were chosen in order that the Working List might include all the stars, 22 in number (including the non-typical Long Period S Persei), observations of which were begun at Rousdon in 1885 (the Rousdon programme was adopted from Harvard), and which were specially interesting from a historical point of view. It may be mentioned that our programme now includes 11 of the 32 stars observed by N. R. Pogson (including U Geminorum and T Piscium, recently added to our List), 11 of the 23 stars observed by G. Knott, and 18 out of the 31 Variables observed by J. Baxendell, whose observations have been published, and in many cases, discussed, by C. L. Brook, H. H. Turner, and Miss Mary Blagg.

In view of the future activity of the Section, it may be interesting, on the occasion of the publication of this Memoir, to ascertain in what measure our present Long Period programme is representative of the chief characteristics of this class of objects. Our 52 stars (including U Cygni) are distributed as follows :—

(*a*) In *Right Ascension* :—

0-2^h	3-5^h	6-8^h	9-11^h	12-14^h	15-17^h	18-20^h	21-23^h
7	6	3	2	9	8	11	6

VIII^h and XI^h are not yet represented in our List.

(*b*) In *Declination* :—

S 30-21°	20-11°	10-0°	0-10°	11-20°	21-30°	N
1	0	2	3	8	5	
N 31-40°	41-50°	51-60°	61-70°	71-80°	81-90°	N
8	7	8	4	5	1	

(*c*) In *Galactic Latitude* :—

0-10°	11-20°	21-30°	31-40°	41-50°	51-60°	61-70°	71-80°	81-90°
11	13	7	7	5	7	2	0	0

We might observe some stars in high galactic latitudes.

(*d*) In *Galactic Longitude*:—

0-30°	31-60°	61-90°	91-120°	121-150°	151-180°	181-210°
9	12	10	8	6	2	1

211-240°	241-270°	271-300°	301-330°	331-360°
0	0	2	0	2

(*e*) According to *length of period*:—

101-150^d	151-200^d	201-250^d	251-300^d	301-350^d
5	7	5	4	7

351-400^d	401-450^d	451-500^d	501-600^d	601-700^d
9	10	3	1	1

The majority of our stars belong to the longer periods. Excluding W Cygni, which is probably a RV Tauri type star, our Variable with the shortest period is R Vulpeculæ (136^d); but it should be borne in mind that *Me* stars with quite short periods have small ranges and are less well suited to the amateur. Our longest period is 612^d (S Cassiopeiæ), not including S Persei, a Rousdon star considered to be more or less irregular, but which might have a period of 1000? days.

(*f*) According to mean *magnitude at maximum*:—

3·1-4·0	4·1-5·0	5·1-6·0	6·1-7·0	7·1-8·0	8·1-9·0	9·1-10·0	10·1-11·0
1	1	5	6	18	14	6	1

(*g*) According to mean *magnitude at minimum*:—

6·1-7·0	9·1-10·0	10·1-11·0	11·1-12·0	12·1-13·0	13·1-14·0	14·1-15·0	>15
1	2	4	8	21	12	3	1

The bright minimum is that of W Cygni. Fifteen of our stars are within the reach of a 3-in. O.G. at minimum.

(*h*) According to *range*:—

1·1-2·0	2·1-3·0	3·1-4·0	4·1-5·0	5·1-6·0	6·1-7·0	8·1-9·0
2	3	8	17	15	6	1

(*i*) According to their *spectrum*:—

M2	M3	M4	M5	M6	M7	M8	S	N	R	Unknown
2	6	3	6	4	11	6	8	3	1	2

All our M, S, and R stars have *e* character (bright emission lines), except X Peg (M2), and W Cyg (M5). The N stars are S Cep [N8], V Cyg [(N)], and T Dra [(N)]; the R star is U Cyg [R8*e*]; the spectrum is unknown for S Aql and U Boo. For 30 out of the 52 objects, the spectrum is known to vary with the light, and the mean spectrum has been taken into account. We might try to observe a few more Variables of the "early" *Me* divisions, although their periods are short and their ranges, therefore, small.

(*j*) According to Leon CAMPBELL's *classification* of mean, smoothed light curves, which starts from the broadest maxima with the sharpest minima (Type I), and ends at the most pointed maxima with the flattest minima (Type VII), Type III representing very closely a sine curve:—

I	II	III	IV	V	VI	VII	Others
3	6	6	7	9	6	0	15

Campbell's stars of types I-III mostly correspond to PHILLIPS' Group I, and those of types IV-VII to Group II. None of our Variables

belong to Campbell's type VII, but as 15 of them have not yet been classified by him, including such well known "veterans" as R Aql, T Cep, S Her, R Ser, judgment on this point must be reserved.

(*k*) According to LUDENDORFF'S *classification* of individual light curves, which rightly takes peculiarities into account, α being curves with sharp rise, β symmetrical curves, γ curves with a pause on the rising branch, or a double maximum :—

α_1	α_2	α_3-γ_1	α_3 pec	α_4	α_4-β_1	α_4-β_2	α_4-γ_1	α pec
1	4	1	1	8	1	2	5	1

β	β_1	β_2	β_2-γ_1	β_3	$\beta_{3\text{-}4}$	γ_1	$\gamma_{1\text{-}2}$	γ_2	pec	Others
1	3	4	1	7	1	4	1	1	3	2

The only stars on our List unclassified in this system are S Aql and U Boo, and they probably belong to the RV Tauri class. We might observe a few α_2 and β_4 stars, but the latter are exceptional.

It will be seen from the above that, in its present state, our Working List is fairly representative of most of the characteristics of Long Period Variables, considered as a class, and that a few more well selected additions would render it unimpeachable as an epitome of objects of this sort.

We cannot expect important progress in the problem of stellar variability without more detailed and numerous spectrographic data, which, in their turn, are dependent upon more powerful instrumental means. The 200-in. telescope now planned in the United States of America, when put into use, will no doubt mark a decisive advance in this respect. But the solution of the whole problem will quite likely result from a combined attack along spectrographic, photometric, statistical, and theoretical lines. No theory of stellar variability will ever be acceptable if it does not interpret in a satisfactory way the peculiarities of the light curves, the changes in the cyclic activity of Variable Stars, and the correlations between their periods, ranges, and spectral types.

The theoretical work based on photometric data, begun by ARGELANDER and his pupils, taken up again by CHANDLER, and developed by TURNER, LUDENDORFF, and others, has a distinct bearing on the purely astrophysical side of the problem. Moreover, as remarked by J. COX, detailed spectroscopic investigations will be restricted, for a long time to come, to a few bright Variables, and light estimates will never lose their importance and intrinsic interest.

THE MEMOIR.

No apology, therefore, seems to be needed in presenting to the astronomical world this somewhat bulky volume containing the greater part of the observations made by the Members of the Variable Star Section of the British Astronomical Association during the quinquennium 1920-1924, which represent in a connected and well digested form the result of their activity.

It is perhaps to be regretted that, owing chiefly to the expense incurred, and, also, to the delay involved in collecting, checking, preparing, and printing these observations with all the care desirable,

it has not been possible to publish them sooner. The Director feels however that this drawback need not be exaggerated, and that, considered in its proper perspective, a publication of this sort should be judged by its contents. That some considerable time should have elapsed since the last observation which it records was made is, in his opinion, a matter of secondary importance. Professor Hertzsprung once said to him "As a student of Variable Stars, I am interested in the past, not in the future." After all, it is but for a short time that observations can be described as "recent," and quite often, like good wine, their value increases with their age.

It seems therefore highly undesirable that accuracy in the records should be *sacrificed* to promptness in publication. More harm than good is done by the hasty and incomplete printing (and mis-printing) of unchecked and redundant observations. More than one compiler has expressed irritation at distorted records, valuable possibly in themselves, but presented in a confusing, misleading, or unintelligible form. Moreover, many records by good observers made during the last century are still in MS., and Members of the Variable Star Section may well congratulate themselves that their work, to which they have devoted so much time and attention, is now, after a comparatively short delay, the common property of all interested.

As to the necessity of printing the original observations of Variables, including the light estimates with known comparison stars (and not merely the light curves, or the dates and magnitudes of maxima and minima), the present Director, in complete agreement with his distinguished predecessors, and most students of this branch of astronomy, feels strongly in its favour.

Although the reasons for such a course are obvious to all engaged in the work, a word of explanation may well be offered on this point in view of the criticisms which may be made regarding the bulk of this volume, and the cost of printing what, to the uninitiated, may look like a large, but rather dull and uninteresting collection of figures.

The chief reason for publishing such observations in full is that they are simply *indispensable* to anyone wishing to study the laws governing the light variations of the stars included in this Memoir. Nothing could replace them in this respect. For, in order to make even an approach to refinement, any such analysis should be carried out on a uniform plan, which should eliminate the various idiosyncrasies of the different observers; for this purpose, direct reference to the individual observations is an *absolute* necessity.

A glance at the *Geschichte und Literatur* by Muller and Hartwig, which collects and discusses most of the data regarding Variables available by the end of 1915, will show that, in many cases, the authors have been considerably hampered by the fact that a large number of observations were inaccessible to them, and that, therefore, they had to rely upon uncontrollable data. This will cause no surprise if we bear in mind that even the expressions "maximum" and "minimum" applied to light curves are somewhat indefinite, relative, and even liable to change in meaning. Professor Turner has shown, for example (*M.N.* 67, 332, 1907), that the locus of middle-points so

commonly used to deduce epochs of maxima and minima "is simply no guide at all," and that all epochs assigned in this way "may be systematically wrong." He has suggested totally different methods of determining the characteristics of curves. Now, if such methods are to be developed and used in future discussions, bearing, for example, on the lengthening or shortening of periods (a subject of extreme significance in astrophysics), investigation of the original observations will certainly be necessary.

One may grant this, but object: "Why should not the original observations be stored away in some library, where they would be at the disposal of interested investigators?" The answer is that there are many practical difficulties and several disadvantages in such an arrangement. Not only does the preparation of the estimates for publication on a uniform and coherent plan afford an opportunity of clearing up many obscure points, and recording a large number of data, which could not be obtained otherwise; the wide publicity given to the printed records must also be borne in mind. This alone ensures their permanency and accessibility—a reward to which the observer is surely entitled when he sacrifices his individual tastes to the rigid discipline of a common undertaking such as our Section.

There is a last point, which may be best illustrated by an example. The American astronomer Edwin P. SAWYER mentions in the *Astronomical Journal* No. 164 that, in 1886, R Scuti remained of the same maximum brightness for 76 days. Now, no such occurrence in connection with this Variable, which was discovered in 1795 by the English amateur Edward PIGOTT, and which has been fairly assiduously observed since that time, is known to have taken place, and it would be very interesting to know on what observational grounds SAWYER made this assertion. For, as far as is known, no other astronomer appears to have followed the vagaries of R Scuti in 1886. But, although SAWYER published the dates (but no magnitudes) of one maximum and two minima of R Scuti for that very year, his observations are still stored away, and it is very doubtful whether they could be obtained upon loan. So, unless, in accordance with the wish expressed by the Commission on Variable Stars of the International Astronomical Union at its Leiden Meeting in 1928, these observations are unearthed and published some day, we must remain in the dark regarding the point in question, though all would at once have been made clear if the observations had been printed.

As to the advisability of printing in full the estimates with the comparison stars from which the magnitude of the Variable for a given date is deduced, it must be remembered that the accepted magnitudes of these comparison stars have only a provisional character. They may be corrected and improved upon. This is especially true for the faintest, which, in the HARVARD sequences, are often overestimated in brightness, because they were measured with comparatively small instruments, or extrapolated by mere estimates. New and better values have lately been obtained for a large number of them by Professor A. S. MITCHELL and his associates with the 26 in. refractor of the Leander McCORMICK Observatory of the University of Virginia, and will be adopted for future observations. Their use

will tend to increase the range of many Long Periods and, possibly, at least in some cases, to modify the shape of the light curve near minimum. In any general discussion aiming at refinement, the present deduced magnitudes, obtained from the old values, will have to be corrected to suit the improved scheme. Some "mean" correction may of course be calculated to connect the two scales, but, as the choice of the comparison stars may affect the final result, the *safer* way would appear to be the re-reduction of the individual estimates, for which the knowledge of the comparison stars is of course strictly necessary. This is especially true for the V.S.S. observers, who are not restricted to the Harvard comparison stars, but have used a large number of HAGEN's stars as well.

THE OBSERVATIONS.

The total number of observations in this Memoir is 43,590. Of these, 780 were made before 1920, so that 42,810 observations of 51 stars belong to the years 1920-1924, giving an average of 168 per star per annum, as compared with the 26,346 observations contained in Memoir XXV for the years 1914-1919, with an average of 146.

This increase fulfils the wish expressed by Mr. C. L. BROOK in the Preface to the Ninth Report.

Speaking generally, it appears that the observations are also somewhat better distributed, not only among the different stars of the Working List, but also over the various parts of the light curves. It will be found *inter alia* that the present work includes a higher proportion of observations of $13^{m}{\cdot}0$, and fainter, than the previous Memoirs. It is hoped that this fact will increase the confidence in the dates of minima deduced from our observations, and add to our knowledge of the less well known portions of some of the light curves. No pains have been spared to try to make our records as full as possible, and especial thanks are due both to the Members who have made a large number of observations in the chilly morning hours of the winter months, and to those who have applied the comparatively large apertures at their disposal to the observation of the fainter stages.

Except under unusual circumstances, such as the rapid rise of some of them, it is probably unnecessary to observe Long Period Variables upon several nights in succession. A certain number of such observations have therefore been omitted as redundant ; a few because they were probably or certainly erroneous ; others owing to uncertainty on the part of the observer, or incomplete information given by him, when more reliable or fuller estimates were available from others. It would obviously be unnecessary, for instance, to record that an observer equipped with a 3-in. telescope considered a Variable to be fainter than $11^{m}{\cdot}1$ when, on the same night, another observer, using one of 10-in. aperture, made a complete estimate showing that the star was something like $13^{m}{\cdot}5$. The total number omitted for these different reasons amounts to 2,986, or about 6 per cent. of those actually made.

In 1922, when the present Director's term of office began, he decided to request that *all* active Members of the Section should, as

far as possible, observe the three stars *o* (Mira) Ceti, χ Cygni, and S Ursæ Majoris, which have a large range in magnitude. This arrangement was made in the hope that, eventually, it may be possible to discover the "personal magnitude equation" of each observer. Large numbers of observations, made under varying circumstances with many different instruments, have therefore accumulated for these three stars ; it is thought that they already provide interesting material, which will be progressively increased, and might be discussed in the way suggested by H. GROUILLER (*Bull. Obs. Lyon*, VIII., 76, 1926).

THE METHODS OF COMPARISON.

Generally speaking, the work of the Section under its present Directorship, has been continued on the same lines as before. Apart from some minor details, the only change worth noticing is the fact that, from this Memoir onwards, the *printed* record of the observations shows more precisely the method employed by the observer in comparing the light of the Variable with that of the Comparison Stars.

As is well known, two methods of determining the brightness of Variables under observation are in general use in the Section : (1) the Fractional Method, by which the brightness is estimated as a fraction of the light interval between a pair of comparison stars, the fraction being either a simple one (General Method), or a decimal one (PICKERING'S Decimal Method) ; and (2) POGSON'S Step-Method, by which the Variable is estimated as so many "steps" brighter than one comparison star, and so many "steps" fainter than another, the "step" being assumed to be $\frac{1}{10}$ of a magnitude.

It should be understood that, strictly speaking, POGSON'S method is, in many cases, a fractional method, or a combination of the fractional method and ARGELANDER'S original "step" method. An observer comparing a Variable with two comparison stars, *knowing* that $a = 9^{m}{\cdot}0$ and $b = 9^{m}{\cdot}5$, and estimating it $a-2$, $b+3 = 9^{m}{\cdot}2$, is performing a fractional operation in which the denominator of the fraction (in this case 5) is always made equal to the number of tenths of magnitude between the two comparison stars. When, as frequently occurs, the observer uses one comparison star only, and makes some comparison such as $a+3 = 8^{m}{\cdot}7$, he is falling back upon the true "step" method, though it may be supposed that, from practice and knowledge of adjacent intervals, the interval "3", in this case, will not differ much from $0^{m}{\cdot}3$. Some Members are in the habit of making estimates independently of the knowledge of the magnitudes of the comparison stars (which are not shown on our Charts) ; these estimates may be often recognised by the fact that the interval $a-b$, as deduced from their record, would differ from the photometric value of the interval in question. In the case of the Director, this interval is sometimes somewhat larger, indicating a "step" slightly less than $0^{m}{\cdot}1$, but not small enough to impair the accuracy of the "nearest tenth."

In previous Memoirs, for the sake of uniformity, the fractional observations had been reduced, in form, to the "step" system from

the adopted magnitudes of the comparsion stars, and it was not possible to infer from the printed record whether an observation had been made in one way or the other; the result of this procedure was that some observations had the appearance of being *direct* estimates between the Variable and a comparison star, involving as much as 9, 10, and even 11 tenths of a magnitude, whereas, in fact, this was in no way the case.

Acting upon the considered advice of such authorities as Father HAGEN and Professor NIJLAND, the Director decided to discontinue this practice, and to print the estimates as recorded by the observer. The fractional observation showing that a Variable *v* was considered to be midway in light between two comparison stars *a* and *b* is now usually recorded as

$$a\ (1)\ v\ (1)\ b$$

and if the comparison stars differed by 10 tenths of a magnitude, the corresponding "step" observation would be recorded as

$$a{-}5,\ b{+}5$$

If the Variable was considered to be brighter than *a* by the interval existing between *a* and *b*, the record would be

$$v\ (1)\ a\ (1)\ b$$

In some cases, half "steps" assumed as =0·05 of a magnitude were used and are recorded as 0·5; these figures sometimes express the mean of two comparisons made in whole steps.

When the two modes of comparison are employed on the same occasion (more generally, the fractional method connecting two stars with the Variable, the "step" comparison but one), double weight is given to the fractional estimate.

The fractional method has been criticised by J. PLASMANN, J. G. HAGEN, and, quite lately, by E. H. VOGELENZANG. It has been maintained that it confines the observer so closely to the photometric scale that he is unable to check it, or even to detect the variability of a comparison star; that it cannot produce a feeling of real certainty; that, when the difference in brightness between the Variable and a comparison star of known magnitude is directly expressed in "tenths" of a magnitude, the value of one "step," nominally $0^{m}{\cdot}1$, will vary in an irregular manner according to the unavoidable errors of the photometric magnitudes of the comparison stars, and cannot therefore be relied upon.

This may be true, at least in part, when the fractional method is applied to the observation of Variables with a small range, or, as is sometimes the case, when the observer of Long Period Variables neglects to record his comparison stars, and only enters the resulting magnitude in his observing book, so that his observation cannot be eventually re-reduced with accuracy.

Practical experience shows however that, with proper precautions, and in the case of Long Periods for which good photometric sequences are available, the fractional method gives quite trustworthy results, especially when one considers the many causes, both intrinsic and extrinsic, which may influence the accuracy of the comparisons, and

that all that can be desired in such work is the "nearest tenth" of a magnitude. In fact, in the opinion of the present writer, who has had more than 20 years' experience of this work, and made more than 10,000 observations of this kind, the fractional method is distinctly helpful, and appears to be much more reliable than any other in all cases where the only available comparison stars in the vicinity of the variable differ largely in magnitude, perhaps by 1^m, or more. As an example, let *a* be $7^m{\cdot}0$, and *b* $8^m{\cdot}5$, and suppose the observer to make a fractional estimate such as *a* (2) *v* (1) *b* = $8^m{\cdot}0$. If, in addition, he makes a "step" estimate such as $b+5=8^m{\cdot}0$, he will certainly feel much more confident of his final result than if the latter estimate only had been made; for most observers would certainly not attempt to estimate the interval between *a* and the Variable, a whole magnitude, in "steps."

As to the assertion that the observer who uses the fractional method is, as it were, bound hand and foot to his comparison stars, and that he will consequently be unable to detect the variability of a comparison star, this is certainly an exaggeration. The careful observer will not fail to compare the photometric intervals of his scale with the stars which he is using, and report discrepancies; several cases are known to us of stars being "suspected" and subsequently avoided by the use of our methods.

At the same time, the merits of the Herschel-Argelander method of "steps" or "degrees," though it had its use for the observation of Long Periods before good photometric sequences were available, and is still to be recommended for the observation of Variables with small range, should not be overrated. ARGELANDER himself *tried* to *make* his "step," not the least perceptible difference between the brightness of two stars, as his own definition of the "step," borrowed from J. HERSCHEL, would imply, but something like $0^m{\cdot}10$, and he recommended his students to imitate his example, which advice, as is well known, they did not follow.

Moreover, Argelander's method, as used by professional astronomers, is not *entirely* distinct from the fractional method. Strictly speaking, it would only permit of comparisons in the form *a2v*; ; *v3b*, without *any* mental reference to the interval *a* *b* = 5 steps. But Argelander was not followed in this practice. SCHÖNFELD (*Beobachtungen von Veränderlichen Sternen*, 1860) plainly says that, in observing a Variable, he *first* determines separately the intervals *a* *v* and *v* *b*, but that afterwards he *also* estimates *a* — *v* *b*; and he adds rather typically that, what the two comparisons thus lose in independence of each other, they *gain* in accuracy. It cannot be denied that an estimate in the form *a*—*v*—*b* has fractional characteristics.

Although this fact is not so well known as it should be, and is commonly omitted in popular descriptions of his procedure, ARGELANDER himself recorded many observations in the form *v* 2 (*a b*), *i.e.*, he first made some sort of fractional observation *a* (1) · (1) *b*, and he then estimated that the Variable was brighter by one step than the *middle point a*—*b* (*Aufforderung an Freunde der Astronomie*, 1844, p. 230). But as soon as the *difference* between two comparison stars is taken into account, what will remain of the independence of

the estimates, and the control over the comparison stars it is assumed to afford, especially since the use of intervals larger than 4 or 5 steps is strongly deprecated? This difference will certainly impress itself upon the memory, especially with Variables of small range for which the same small number of intervals return almost night after night. And if I am *used* to estimate $a-b$ as 5 steps, shall I detect a change if a gets half a step, say $0^m{\cdot}05$ brighter, making the interval 5·5 steps? And we must take into consideration the difficulty of determining the value of the step, which is liable to vary with the observer, the time, the conditions of the air, the instrument used, the brightness and relative position of the comparison stars, and even the Variable observed.

May we therefore not conclude with E. C. PICKERING: "Each method has its advantages, and that to be used should doubtless depend on the temperament of the observer"?

THE COMPARISON STARS.

In the compilation of this Memoir, great care has been taken to enable all the comparison stars used, as well as the source of the magnitudes adopted for them, to be clearly identified.

As a general rule, comparison stars, as far as possible, are *designated* by their *numbers* in HAGEN'S *Atlas Stellarum Variabilium*. An exception to this general rule is made for the three Variables *o* (Mira) Ceti, T Cephei, and R Leonis, which had already been observed for some time by the Section before 1907, when Series IV of HAGEN'S *Atlas*, in which they are contained, was published, and for V Camelopardalis, W Lyræ, and X Pegasi, for which Charts and sequences have only recently been issued in Series VII of the same *Atlas* (1927). In these cases, the Harvard small Arabic letters of *H.A.* Vols. 37 and 57, have been retained; in the case of R Leonis and *o* (Mira) Ceti, they have been supplemented by some of HAGEN'S numbers.

For X Camelopardalis, W Cassiopeiæ, W Coronæ, and RY Ophiuchi, for which no HAGEN Charts have yet been published, the lettered HARVARD comparison stars have been adopted. For W Cygni, we have used our own sequence, prepared by the late Colonel E. E. Markwick, and completed by the present Director.

Since the period (1914-1919) dealt with in *Memoir* XXV, HAGEN'S valuable *Aggiunte alle Carte dell' A.S.V.* (Rome, 1922) has appeared. The numbers of faint stars as given in this work have been adopted, but in the case of comparison stars which had previously been used by the Section, the designations previously employed have been retained, for the sake of uniformity.

As HAGEN'S sequences only cover the immediate vicinity of telescopic Variables, use has often been made in addition of (generally) bright comparison stars of the Harvard sequences from *H.A.*, Vols. 37 and 57. They are designated by small Arabic letters, and include a few "additional" stars from *H.A.* 37, pp. 15-17, and 182-184, designated by their capital letters.

All other supplementary stars, not contained in the works named, and chosen for the convenience of V.S.S. observers, are given at the head of each series of observations, with their designation—most generally a capital letter; and, when not identified in some catalogue, with their approximate co-ordinates with respect to the Variable.

All our observations are reduced to the Harvard visual scale.—To effect this, our Comparison Star Lists include the "adopted magnitudes" of most of the comparison stars in the sequences in *H.A.*, Vols. 37 and 57. For those of HAGEN's stars which have no HARVARD letter assigned to them, values have been deduced from the "grades" given in the Harvard *Annals*. Of the precise values employed, the majority have been calculated from these "grades" by Directors of the Variable Star Section; a few, however, have been obtained from HAGEN's *Aggiunte all' Catalogo dell' A.S.V.* (Rome, 1916); these are reduced on the Harvard scale.

All the magnitudes of the bright supplementary stars given at the head of our observations are obtained from the *Harvard Annals*. Those of the supplementary stars first used by us in the years 1920-1924 are generally to be found in the *Harvard Revised Photometry* (*H.A.*, Vol. 50, 1908) and its *Supplement* (*H.A.*, Vol. 54, 1908). For bright Harvard stars already used in previous *B.A.A. Memoirs*, the latter volumes are cited whenever the magnitude from previous Harvard *Annals* appear unmodified therein; for those for which the values were different, the older values which, as a rule, differ little from those more recently published, have been retained, and the source indicated, the two figures following the letters *H.A.* referring to the volume and page in question.

Whenever changes have been made in, generally faint, Harvard magnitudes, because they did not appear to conform to the usual scale, this has been expressly stated.

THE RECORD.

Table A gives the names of the 48 contributors to this *Memoir*, preceded by the abbreviations used to designate them, and the location of each, with its approximate geographical co-ordinates.

Table B describes the instrument or instruments used by each observer, with its (or their) aperture in English inches, and the powers used when more than one telescope has been employed.

Table C shows the distribution of the 43,590 observations among the 51 stars and the 48 observers.

It will be seen that eleven of them made each more than a thousand observations; Mr. C. F. BUTTERWORTH, one of the most active of living Variable Star observers, more than 12,000, or approximately one-fourth of the total; Mr. A. N. BROWN more than 5,000; Prof. A. A. NIJLAND more than 2,500.

In the general Tables, pp. 1-400, are given the details of the individual observations, arranged in chronological order. The form in which they are printed is, at the suggestion of Mrs. Walter MAUNDER,

TABLE A.

Abbreviation.	Name.	Locality.	Lat.	Long.
AB	A. Brun	Le Breuil, Allier, France	+46° 11′	3° 39′E
Ad	H. B. Adames (the late)	Ilford, Essex	+51 34	0 5 E
Ba	M. K. Bappu	Hyderabad, Deccan, India	+17 10	78 20 E
Bg	J. H. Bridger	Croydon, Surrey	+51 22	0 6 W
Bh	C. F. Butterworth	Poynton, Cheshire	+53 21	2 8 W
Bk	T. P. Bhaskaran	Hyderabad, Deccan, India	+17 10	78 20 E
Bl	J. van der Bilt (Dr.)	Utrecht, Holland	+52 7	5 8 E
Bn	A. N. Brown	nr. New Barnet, Herts	+51 39	0 9 W
		Bucklebury Common, Berks*	+51 26	1 12 W
Bo	J. J. Bougon (Capt.)	Amiens, Somme, France	+49 54	2 18 E
Br	C. L. Brook	Meltham, Yorks	+53 36	1 51 W
Ca	R. G. Chandra	Jessore, India	+23 10	89 10 E
Cm	M. S. Chisholm (Miss)	Goulbourn, N.S.W., Australia	−34 46	149 42 E
Cn	A. W. G. Cousins	Johannesburg, S. Africa	−26 11	28 7 E
Co	E. H. Collinson	Ipswich, Suffolk	+52 4	1 10 E
D	Felix de Roy	Deurne, Antwerp, Belgium	+51 13	4 27 E
Ga	W. T. Gayfer	Cleethorpes, Lincs	+53 34	0 2 W
Gi	N. V. Ginori	Florence, Italy	+43 46	11 15 E
Gl	O. A. Glastonbury	Adelaide, S. Australia	−34 46	138 31 E
Gr	H. R. Grimwood (the late)	Florence, Italy	+43 46	11 15 E
Ha	G. P. B. Hallowes	Colehill, Dorset	+50 48	1 59 W
Hw	E. J. How (Rev.)	Bromley, Kent	+51 24	0 2 E
Kw	G. F. Kellaway	Cheam, Surrey	+51 22	0 13 W
Lp	G. H. Lepper	Harrow, Middlesex	+51 35	0 15 W
Li	W. M. Lindley	Rugby, Warwickshire	+52 22	1 16 W
		nr. Padstow, Cornwall†	+50 32	4 56 W
Ma	E. E. Markwick (the late)	West Moors, Dorset	+50 49	1 54 W
Mn	G. Merton (Dr.)	Cambridge	+52 12	0 7 E
Ms	A. A. Miles	York	+53 57	1 5 W
Mu	J. S. Murray	Cambridge	+52 12	0 7 E
My	M. Moye (Prof.)	Montpellier, Hérault, France	+43 36	3 53 E
Ni	A. A. Nijland (Prof.)	Utrecht, Holland	+52 7	5 8 E
Ph	T. E. R. Phillips (Rev.)	Headley, Surrey	+51 16	0 16 W
Pr	E. Prentice (the late)	Ashstead, Surrey	+51 19	0 18 W
Rd	V. Reynolds (Miss)	Barnes, Surrey	+51 28	0 14 W
Ry	P. M. Ryves	Zaragoza, Spain	+41 39	0 53 W
Sa	F. Sargent	Durham	+54 47	1 34 W
Sg	S. Solberg (Rev.)	Oslo, Norway	+59 54	10 43 E
Si	H. Simmons	Edlesborough, Bucks	+51 53	0 35 W
Sk	J. F. Skjellerup	Cape Town, S. Africa	−33 56	18 25 E
Sm	W. H. Smith	Plumstead, S. Africa	−34 1	18 29 E
St	W. Strachan	Bournemouth, Hants	+50 43	1 53 W
Th	H. Thomson	Newcastle-on-Tyne	+54 58	1 36 W
Tm	A. Thom	Dunlop, Ayr	+55 43	4 32 W
Tn	F. C. Thomson	Drumchapel, near Glasgow	+55 54	4 22 W
Wb	H. Webber	Studham, Beds	+51 51	0 31 W
Wd	C. J. Westland	Apia, Samoa	−13 50	171 46 W
Wf	W. F. H. Waterfield	Nakusp, B.C., Canada	+50 13	117 46 W
Wh	H. Whichello (Dr.)	Chester	+53 12	2 54 W
Wi	J. W. Wilson	Forest Hill, London	+51 26	0 3 W

* From 1923, August.

† From 1924, October.

TABLE B.

Name.	Instrument.	Powers.
H. B. Adames (the late)	4-in. O.G.	
M. K. Bappu	15-in. O.G.	150.
T. P. Bhaskaran	$2\frac{3}{4}$-in. O.G.	(Recorded as t).
J. J. Bougon (Capt.)	10-in. spec.	55, 130, 140, 160, 225, 275.
	$4\frac{1}{4}$-in. O.G.	23, 70, 105.
	$2\frac{1}{4}$-in. O.G.	13, 50.
J. H. Bridger	$8\frac{1}{2}$-in. spec.	30, 55, 75, 110, 142, 180.
	4-in. O.G.	26, 48, 65, 100.
C. L. Brook	10-in. spec.	
A. N. Brown	5-in. O.G.	25, 50, 70, 95, 120, 150, 167, 200.
	3-in. O.G.	30, 60, 75, 85, 120.
	2-in. O.G.	16.
A. Brun*	4-in. O.G.	80.
C. F. Butterworth	15-in. spec.	60, 120.
	6-in. O.G.	45, 90, 150.
R. G. Chandra	3-in. O.G.	
M. S. Chisholm (Miss)	3-in. O.G.	
E. H. Collinson	$4\frac{1}{2}$-in. O.G.	60.
	3-in. O.G.	30, 80.
A. W. G. Cousins	Binoculars.	
Felix de Roy	8-in. spec.	30, 60, 120.
	4-in. O.G.	40, 80.
	$2\frac{1}{2}$-in. O.G.	31, 62.
W. T. Gayfer	8-in. spec.	60, 120.
	3-in. O.G.	60.
N. V. Ginori	9-in. O.G.	47, 75, 117.
	4-in. O.G.	43.
O. A. Glastonbury	$8\frac{1}{2}$-in. spec.	
H. R. Grimwood (the late)	$8\frac{1}{2}$-in. spec.	
G. P. B. Hallowes	$12\frac{1}{2}$-in. spec.	68, 86, 121, 172, 215, 244.
	3-in. O.G.	33, 60.
E. J. How (Rev.)	$3\frac{1}{2}$-in. O.G.	
G. F. Kellaway	$8\frac{1}{2}$-in. spec.	60.
	$4\frac{1}{2}$-in. O.G.	60, 64.
G. H. Lepper	$6\frac{1}{2}$-in. spec.	
W. M. Lindley	$5\frac{1}{2}$-in. O.G.	34, 44, 94, 193, 297.
	$3\frac{1}{2}$-in. O.G.	37, 83.
E. E. Markwick (the late)	8-in. spec.	28, 50, 79, 130, 183.
	4-in. O.G.	32, 51, 108, 230.
G. Merton (Dr.)	6-in. O.G.	32, 60, 90, 120, 130, 135.
	4-in. O.G.	38, 65, 140.
	3-in. O.G.	12.
A. A. Miles	$4\frac{1}{2}$-in. O.G.	60.
	3-in. O.G.	60.
M. Moye (Prof.)	Binoculars.	
J. S. Murray	2-in. finder.	
A. A. Nijland (Prof.)	10-in. O.G.	94.
	3-in. O.G.	22.
T. E. R. Phillips (Rev.)†	$12\frac{1}{4}$-in. spec.	69, 92, 146, 232.
	8-in. O.G.	44, 114, 145, 211.

* Mr. Brun also used twin refractors of 3-in. aperture attached to prismatic binoculars bearing a power of 25. This instrument is indicated by the number 25 in the third column of the observations.

† When no power is mentioned in Mr. Phillips' observations, his reflector has been designated M, the refractor O.G.

TABLE B (*continued*).

Name.	Instrument.	Powers.
E. Prentice (the late)	9-in. spec.	
V. Reynolds (Miss)	8½-in. spec.	80, 110.
	3-in. O.G.	...
P. M. Ryves	5-in. O.G.	20, 30, 50, 80, 110, 170, 200.
	3-in. & 2-in. O.G.'s.	8, 10, 13, 17, 20, 30, 35, 50, 55, 85.
F. Sargent	6·4-in. O.G.	
H. Simmons	4½-in. O.G.	
J. F. Skjellerup	3-in. O.G.	
W. H. Smith	3-in. O.G.	
S. Solberg (Rev.)	6-in. spec.	
W. Strachan	9-in. O.G.	
A. Thom	3-in. O.G.	
F. C. Thomson	9-in. spec.	
H. Thomson	12½-in. spec.	
J. van der Bilt (Dr.)	10-in. O.G.	94.
	3-in. O.G.	22.
W. F. H. Waterfield	12½-in. spec.	
H. Webber	4-in. O.G.	20, 37, 40, 50.
	2¾-in. O.G.	20, 40.
C. J. Westland	4-in. O.G.	
H. Whichello (Dr.)	6-in. O.G.	
J. W. Wilson	8½-in. spec.	44, 71, 120.
	3¾-in. O.G.	28, 33, 48, 53, 90.
	3⅛-in. O.G.	80, 100.
	2¾-in. O.G.	20.
	2¼-in. O.G.	10.

F.R.A.S., Editor of the B.A.A. publications, more condensed than that adopted in our previous Memoirs ; it will be seen that, though considerable space is thus gained, no essential detail is omitted.

With the Argelander letter or the Hartwig double letter for each Variable, two other designations are given at the head of each series of observations ; the number of the Chambers-André-Nijland scheme, which shows the order of the discovery in the constellation, being printed on the right of each name ; the Harvard figures denoting the approximate Right Ascension and Declination for 1900, appearing on the next line below. On the left of the name of the Variable, Chandler's number is given.

The dates, calendar as well as Julian (with omission of the constant number 242 0000 for the latter), given in *Columns* 1 *and* 2, refer to the Astronomical Day commencing at Noon, Greenwich Mean Time.

The figure given in *Column* 3 shows the power used, and, from this, by reference to Table B, the type and aperture of the instrument. If the same power is used by an observer on two telescopes, a note is added, "T" indicating the larger, "t" the smaller instrument. These two letters, having the same signification, are also inserted in this column when the observer fails to state the power employed ; and, occasionally, when more precise information is not supplied, "T"

Observer.	Abbreviation	R Andromedæ	W Andromedæ	R Aquilæ	S Aquilæ	R Arietis	R Aurigæ	X Aurigæ	R Boötis	S Boötis	U Boötis	V Boötis	R Camelopardalis	V Camelopardalis	X Camelopardalis
H. B. Adames (the late)	Ad	...	...	...	...	...	...	3	...	...	...	...	5	...	5
M. K. Bappu	Ba	...	...	...	...	...	...	...	...	...	...	...	...	...	...
T. P. Bhaskaran	Bk	7	4	...	...	4	...	...	...	...	...	...	...	...	...
J. J. Bougon (Capt.)	Bo	...	...	37	...	91	65	...	67	64	...	77	77	...	...
J. H. Bridger	Bg	46	99	...	...	78	...	...	...	79	...	...	...	55	...
C. L. Brook	Br	59	52	7	3	49	67	60	...	...	23	29	...	66	...
A. N. Brown	Bn	47	53	200	147	112	115	107	168	21	91	159	...	45	23
A. Brun	AB	...	...	...	...	...	...	...	...	31	...	...	111	15	10
C. F. Butterworth	Bh	219	240	336	452	...	...	358	322	219	393	331	226	116	40
R. G. Chandra	Ca	21	55	7	...	42	25	50	65	53	...	57	21	...	2
M. S. Chisholm (Miss)	Cm	...	...	...	...	...	...	...	...	...	...	...	...	...	...
E. H. Collinson	Co	...	...	30	...	...	...	...	...	107	...	189	...	...	4
A. W. G. Cousins	Cn	...	...	...	...	...	...	...	...	...	...	...	...	...	...
F. de Roy	D	32	62	76	9	63	57	61	108	74	87	113	...	50	12
W. T. Gayfer	Ga	...	4	...	...	4	1	...	5	...	...	...	...	...	
N. V. Ginori	Gi	...	41	...	59	39	...	...	...	51	54	...	48	39	...
O. A. Glastonbury	Gl	...	...	...	...	...	...	...	...	...	...	...	...	...	...
H. R. Grimwood (the late)	Gr	15	...	84	98	11	...	...	...	...	...	...	62	...	...
G. P. B. Hallowes	Ha	9	4	...	6	...	...	...	...	...	21	...	...	...	...
E. J. How (Rev.)	Hw	...	...	...	33	...	37	...	...	...	...	...	...	...	...
G. F. Kellaway	Kw	...	...	...	17	4	...	...	...	3	...	25	...	...	...
G. H. Lepper	Lp	27	...	32	11	71	...	...	...	...	...	82	55	...	...
W. M. Lindley	Li	4	5	6	15	10	38	22	6	15	6	8	23	1	
E. E. Markwick (the late)	Ma	16	9	46	...	17	54	45	45	...	...	39	...	...	...
G. Merton (Dr.)	Mn	21	...	...	...	...	...	...	...	16	13	...	24	...	...
A. A. Miles	Ms	...	...	...	...	...	...	...	4	...	...	...	...	...	...
M. Moye (Prof.)	My	...	...	...	...	...	...	...	...	...	...	...	...	...	...
J. S. Murray	Mu	...	...	...	...	...	...	...	...	...	...	...	...	...	...
A. A. Nijland (Prof.)	Ni	...	111	117	...	124	118	148	...	97	...	...	114	...	...
T. E. R. Phillips (Rev.)	Ph	5	4	...	...	...	7	...	...	...	...	...	15	15	...
E. Prentice (the late)	Pr	...	...	...	...	...	10	...	...	...	...	...	...	...	...
V. Reynolds (Miss)	Rd	...	...	...	...	...	...	31	...	...	...	...	...	...	2
P. M. Ryves	Ry	...	...	18	...	27	...	...	24	...	...	26	...	...	...
F. Sargent	Sa	...	...	...	...	...	43	...	...	51	...	...	56	...	...
H. Simmons	Si	...	...	...	14	...	...	...	...	...	...	...	...	...	...
J. F. Skjellerup	Sk	...	...	...	...	...	...	...	...	...	...	...	...	...	...
W. H. Smith	Sm	...	...	...	...	...	...	...	...	...	...	...	...	...	...
S. Solberg (Rev.)	Sg	...	...	...	...	...	3	1	...	...	1	...	...	...	...
W. Strachan	St	...	...	...	11	...	...	...	...	...	...	...	...	...	...
A. Thom	Tm	...	...	...	...	...	...	...	...	...	...	...	...	...	3
F. C. Thomson	Tn	...	38	...	...	49	43	...	...	...	...	36	...	...	...
H. Thomson	Th	...	...	...	...	...	8	...	...	...	3	...	...	18	
J. van der Bilt (Dr.)	Bl	15	...	...	...	...	...	...	118	...	...	119	...	9	...
W. F. H. Waterfield	Wf	67	70	...	79	46	51	...	...	58	...	...	92	72	...
H. Webber	Wb	6	...	...	...	2	...	...	...	...	...	...	...	...	...
C. J. Westland	Wd	...	...	...	...	...	...	...	...	...	...	...	...	...	...
H. Whichello (Dr.)	Wh	...	...	...	...	...	...	...	...	...	...	...	...	...	7
J. W. Wilson	Wi	...	...	...	55	...	...	...	...	37	...	36	...	...	...
Totals, ...		616	851	996	1009	843	742	886	932	976	692	1326	929	501	113

TABLE C.

	R Cassiopeiæ	S Cassiopeiæ	T Cassiopeiæ	W Cassiopeiæ	S Cephei	T Cephei	o (Mira) Ceti	S Coronæ	W Coronæ	χ Cygni	R Cygni	S Cygni	V Cygni	W Cygni	R Draconis	T Draconis	R Geminorum	S Herculis	T Herculis	U Herculis
8	...	...	...	...	...	...	...	...	31	...	...	...	...	...	...	...	...	41	42	...
	...	...	...	...	...	...	...	...	...	1	1	1	...	...	...	...	...	...	...	...
	...	7	...	...	...	...	...	...	...	5	7	9	...	...	...	...	...	...	...	...
	57	...	41	...	...	72	...	70	...	55	...	...	...	...	101	...	...	65	67	...
	99	...	...	...	...	...	7	...	90	15	...	...	...	...	157	...	71	...	109	...
	71	...	...	3	...	46	35	69	...	111	71	...	19	...	80	...	48	...	50	13
2	102	12	2	100	...	175	82	154	77	134	131	2	111	307	247	...	77	168	222	31
1	...	...	52	...	...	64	...	...	...	...	...	...	...	68	81	...	...	...	...	...
0	290	90	235	490	127	277	234	297	271	324	...	...	390	347	136	...	262	302	...	238
9	...	...	39	...	...	17	136	62	...	86	19	...	14	...	16	3	33	3	34	45
	...	...	...	...	...	...	16	...	...	...	...	...	...	...	...	...	...	...	...	...
5	...	...	182	...	...	139	20	...	...	129	...	...	...	...	191	...	75	...	...	...
	...	...	...	...	...	...	93	...	...	...	...	...	...	...	...	...	...	...	...	...
5	75	...	87	97	...	121	79	74	25	127	90	...	99	291	126	...	47	72	125	83
3	...	...	...	...	...	...	2	...	4	...	...	...	...	...	4	...	2	5	...	...
	47	...	45	40	...	...	...	...	...	...	...	...	36	...	...	...	...	52	...	45
	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	...	...	...	...	...	...	4	...	...	9	...	...	...	...	...	...	7	...	7	...
	...	1	...	10	...	...	6	...	...	22	21	3	7	...	...	14	...	...	...	...
	41	...	...	...	...	...	44	...	...	...	...	...	...	...	44	...	...	...	...	...
	...	...	2	...	...	2	...	6	...	3	...	...	...	...	3	...	...	...	13	...
	...	28	...	56	44	...	24	...	...	55	...	10	...	...	83	3	...	...	89	...
6	8	9	81	19	...	8	20	19	...	9	13	8	10	8	12	...	34	2	9	2
	58	...	...	...	...	53	57	53	...	212	68	...	...	103	58	...	52	32	37	...
	33	...	32	...	...	...	...	...	...	31	...	...	21	54	...	...	...	...	...	...
	...	...	20	...	...	...	...	...	...	...	...	...	...	...	20	...	...	...	1	2
	...	...	...	...	...	...	37	...	...	...	...	...	...	...	...	...	...	...	...	...
	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	...	39	117	...	35	128	221	135	...	182	126	...	...	141	116	...	...	...	...	...
	6	7	...	...	...	...	...	...	11	...	7	23	8	...	6	18	...	...	...	...
	6	...	...	...	...	3	...	10	...	...	...	...	...	...	...	...	8	...	24	...
2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	4	...	...	...	...	...	12	23	...	...	...	...	...	...	...	...	39	39	27	...
	15	44	81	45	51	...	32	...	...	67	...	31	...	...	...	...	...	...	...	...
	...	...	...	...	18	26	...	19	...	...	13	...	...	...	...	...	...	...	...	...
	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	...	...	...	...	...	...	19	...	...	...	...	...	...	...	...	...	...	...	...	...
	...	...	...	...	...	...	...	...	...	3	...	...	...	...	...	...	...	...	...	...
	...	...	...	...	...	...	...	...	...	...	4	...	...	...	...	...	...	...	...	...
1	...	...	...	...	...	...	...	...	...	•	...	...	...	...	...	...	...	...	...	...
	...	...	...	...	...	...	...	...	...	26	29	...	...	...	...	...	...	...	...	...
9	10	...	...	...	...	6	...	...	4	11	14	...	6	...	...	...	10	1	...	...
	110	...	...	...	...	...	...	...	17	...	...	18	9	...	...	18	...	...	...	...
	...	99	...	...	5	...	28	77	78	38	54	60	52	...	...	...	32	...	66	81
	...	...	...	...	...	...	2	...	...	...	...	...	3	...	...	...	...	...	...	25
	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
3	26	...	...	18	...	...	...	...	...	...	...	...	...	...	...	...	21	24	...	3
	...	...	...	85	...	83	...	...	...	56	...	...	...	90	...	...	43	40	...	23
4	1058	336	1016	963	280	1220	1210	1068	608	1711	668	165	785	1409	1481	56	861	846	922	591

R Leonis	R Lyncis	W Lyræ	RY Ophiuchi	U Orionis	R Pegasi	X Pegasi	R Persei	R Serpentis	V Tauri	R Ursæ Majoris	S Ursæ Majoris	T Ursæ Majoris	S Ursæ Minoris	S Virginis	R Vulpeculæ	Totals.
...	...	43	...	...	7	...	...	...	...	...	...	...	...	...	...	230
...	...	...	1	...	1	...	...	...	...	...	...	...	...	...	1	6
...	...	...	6	...	6	5	...	...	5	...	...	...	...	7	8	80
56	35	...	...	...	56	...	...	...	...	127	105	125	111	...	...	1621
...	...	141	...	65	...	67	...	62	...	...	31	106	...	...	91	1468
31	17	...	43	47	...	13	2	57	7	...	79	84	...	...	36	1447
89	...	124	99	59	59	...	33	110	104	184	225	217	161	64	49	5267
...	...	...	...	...	...	...	...	...	...	73	87	...	67	...	...	750
246	247	375	310	269	271	292	59	272	360	339	147	...	306	204	362	12107
33	...	...	...	48	7	...	...	10	18	30	69	48	...	52	...	1348
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	16
102	...	...	...	...	...	...	...	...	...	29	68	...	...	...	...	1306
6	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	145
71	...	116	20	16	20	35	...	73	18	99	125	88	70	51	59	3413
2	...	4	...	...	4	...	...	4	...	...	...	4	5	...	5	62
...	42	...	59	...	...	35	28	...	...	...	...	...	...	...	55	841
...	...	...	...	...	...	...	...	...	...	...	...	...	...	5	...	114
...	22	78	...	...	...	...	6	4	10	...	6	...	...	3	80	506
...	...	...	...	...	...	...	...	...	2	...	48	30	...	...	...	204
26	...	...	...	18	13	...	...	...	...	...	54	...	62	...	...	372
9	...	...	...	6	...	...	...	...	...	...	9	...	...	2	...	104
...	...	...	...	40	...	2	39	34	37	...	81	44	...	...	...	947
16	33	6	1	10	1	4	31	1	15	12	28	22	33	5	5	660
93	...	...	...	46	17	...	...	39	...	86	60	51	64	...	11	1532
...	...	...	...	...	...	4	...	...	...	...	...	...	...	...	...	249
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	47
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	37
8	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	8
...	105	...	...	...	...	...	...	...	...	120	126	123	...	...	...	2543
...	7	...	8	...	...	10	...	11	3	...	...	8	...	...	1	180
...	...	...	...	...	8	...	...	...	...	...	...	9	...	...	10	88
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	53
2	...	...	...	42	54	...	...	21	...	...	...	...	...	10	...	374
...	51	...	...	31	...	...	...	...	23	...	77	61	...	...	...	759
...	23	...	...	...	...	...	...	...	...	...	...	...	...	...	9	122
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	47
...	...	...	...	...	...	...	...	...	...	...	...	...	...	32	...	83
...	...	...	...	...	...	...	...	...	...	...	2	...	...	...	...	10
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	15
...	...	23	...	...	...	...	...	8	...	34	...	...	...	...	...	96
23	...	...	...	...	...	...	...	5	...	...	...	44	...	...	...	293
...	...	6	...	4	...	...	...	3	8	...	...	7	3	2	...	133
110	...	...	...	...	...	...	16	96	...	...	...	...	22	...	115	792
...	66	108	91	...	...	53	39	...	47	58	41	62	81	32	65	1948
32	...	...	...	9	...	...	5	30	...	...	...	...	...	...	...	114
...	...	...	...	...	...	...	...	...	...	...	...	...	...	5	...	20
16	1	40	...	...	...	...	...	20	20	19	...	19	...	...	...	300
58	24	15	...	...	...	...	...	...	...	...	58	...	...	19	...	733
1029	673	1079	638	710	524	520	258	860	677	1210	1526	1152	985	493	962	43590

indicates the use of some sort of telescope, as opposed to "B" = Binoculars, and "F" = Finder. "NE" signifies a naked-eye observation.

The great majority of the observations have been *reduced* to the *hundredth* of a magnitude, as the magnitudes of most of the comparison stars are given in this form, and experience has shown that, when the latter values are rounded off to the nearest tenth *before* the reduction is made, errors of more than $0^m{\cdot}1$ may occur; but, of course, the final result is given to tenths only in *Column* 6.

The letters *b* and *c* affixed to the Deduced Magnitude indicate respectively what is described by the observer as a second or a third class observation.

The following numerical Colour Scale has been suggested by the Director for the use of the Section. It was proposed by J. G. Hagen in *Specola Vaticana* III (Rome, 1911) to afford more symmetry than J. F. Schmidt's original scale (1872), and to link up the linear German colour scales with the two-dimensional system of colour notation by letters devised by W. S. Franks and used by several English observers to estimate the colour of the stars. This Hagen scale has been adopted by H. Osthoff (from 1912), and by A. A. Nijland (from 1915), and can be easily adapted to Schmidt's scale by substituting 9^c for his 10^c :—

0^c	Pure White	W	6^c	Orange	O
1	Yellowish White	YW	7	Deep Orange	RO
2	Pale Yellow	WY	8	Reddish Orange	OR
3	Pure Yellow	Y	9	Red	R
4	Deep Yellow	OY	10	Pure Red	SR
5	Pale Orange	YO		(never observed)	

When this scale has been used, a number is inserted in the Notes followed by the letter ^{c} (4^c &c.), but whenever an observer does not definitely refer to the scale, his exact words describing the colour of the Variable have been given.

Very occasionally, the compiler has had reason to doubt the accuracy of an observation which, owing to paucity of other estimates, it seemed desirable to record. Such observations have been described in a Note, to which his initials are appended, as "doubtful."

In concluding these few remarks, the Director desires to state that, during the compilation of this Memoir, all doubtful points have been from time to time submitted to him for his consideration, and that he has himself examined, and in some cases revised, the details regarding comparison stars at the head of each series, as well as the figures appearing in Table A. With a due sense of gratitude to all concerned, he expresses his heartfelt thanks to the individuals and Institutions through whose instrumentality the publication of the present volume has been made possible.

To Mr. A. N. Brown, M.A., F.R.A.S., the able and active Honorary Secretary of the Section, and quite certainly its oldest and staunchest supporter, he is under the deepest obligation. Mr. Brown has compiled all the lists of observations from the original records of the ob-

servers, and checked most of these, a very laborious task which he has performed with untiring zeal and devotion, and with the greatest accuracy. Our Honorary Secretary is now in the happy position of being able to devote a large portion of his time to the service of the Section. It is no exaggeration to say that without his constant help and advice the latter could not have flourished as it has done, and as the large number of observations contained in this volume eloquently testify. Moreover, his share in these observations, to which he has contributed for more than twenty years, is a considerable and valuable one. May he long enjoy leisure and health to further our progress by his splendid energy.

Our sincere thanks are also due to Mr. G. P. B. Hallowes, F.R.A.S., one of the most active observers of Variable Stars, who, besides checking the whole of the MS. of this Memoir by comparing it with the observers' sheets, read all the proofs after Mr. Brown had finished with them, thus securing, as far as possible, the degree of accuracy in the records which it has always been the aim of the Section to maintain.

Though not so heavy as might have been anticipated from the increase of the number of observations made during the last quinquennium, the expense of printing this Memoir has been considerable, little less than £500. Fortunately, several Members of the Section most generously offered to defray it in part, and the following sums have been received for this object:—£100 from Mr. C. L. Brook, M.A., F.R.A.S., formerly Director of the Section, who has not ceased to display the liveliest interest in its various activities; £100 from Mr. A. N. Brown; £10 from Mr. W. M. Lindley, M.A., F.R.A.S.; £10 from Mr. T. H. Muras; and £20 from Mr. William Strachan, F.R.A.S. The best thanks of the Director and the Association are tendered to these gentlemen, for, without their help, it would not have been possible to publish this Volume. In addition, their contributions, together with a grant of £150 from the B.A.A., making a total of £390, possibly had some weight with the International Astronomical Union, at their Leiden Meeting in 1928, when they decided to vote a grant of £76 to complete the sum necessary. This token of sympathy towards the work of the Section has been deeply appreciated, and our most sincere thanks are due to Professor Turner, who kindly made the proposal, to Commission 27 on Variable Stars and its president, Dr. Harlow Shapley, upon whose application the grant was made, the Executive Committee who accepted the application, and the General Assembly who adopted it.

But it should not be forgotten that this Memoir, the Tenth issue of a series which was begun in 1892—our First Report was of the most modest dimensions, containing 72 pages—is primarily the work of the Members of the Section. The long hours they have spent at the telescope and in dealing with their observations, their genuine enthusiasm, the sense of discipline they have displayed in submitting to our rules and programme, now find their reward in this publication which, it is confidently hoped, will prove to be a far from contemptible contribution to Astrophysics.

The Director and his Associates trust that this result will stimulate them to renewed efforts, which will not only develop still further the scope of our work, but maintain unimpaired the standard of completeness which the Section has always striven to attain.

ANTWERP, 1929, *April.*

Errata in Vol. XXV.

p. ii, *for* La Breuil, *read* Le Breuil.
p. 216, *for* H.D. 132706, *read* 132*706*.
p. 483, *for* DM + 46°5358, *read* +45°3558.
p. 543, *for* Nov. *read* Mar.

INTRODUCTION.

By Professor H. H. Turner, F.R.S.

Many weeks, I fear, have already elapsed since I was again honoured by an invitation to write a few words of Introduction to this new volume of Observations by the B.A.A. hard workers. But I am seizing the first available hours at the conclusion of a busy summer term to set about the response. And at last the previous relevant volumes are spread out on one of the new tables which a recent welcome extension of the University Observatory buildings has provided: a table still in that condition which a work-table so seldom presents, viz., with only a moderate fraction of its space occupied. But in the spreading I found reason to be ashamed of the dust on them, indicative of a regrettably long interval since they have been used. This seems like blameworthy neglect of a side of astronomy in which we are all deeply interested; may I plead in extenuation that I have really been busily at work on a "variable star," though not one hitherto recognised as such? The fact is that the earthquakes which have demanded a good deal of my attention lately, seem to shew that our Earth is a "variable star," for they have a tendency to recur in a period near 21 minutes; and one possible interpretation of this fact is that the earth itself has some variation in this period. The evidence on which I have been for some years chiefly at work is that of the numerous earthquakes in the Philippines, collected by the Jesuit Fathers at Manila, during the years 1890-1926; or let us say from 1903-1926, for the first dozen years suffer from various uncertainties of time determination, though there is nothing like serious discordance with the later years. Still even if we limit attention to the years 1903-26, there are a good many periods of 21 minutes in 24 years, and to find that this variation persists during that time, as I find it does, is surely a striking and significant fact. Moreover the fluctuation has a further character in common with some variable stars; the maximum has a periodic swing through about 90° of the cycle, completed in 1·28 years, or one-third of 3·83 years, which has been noted in other connections as affecting earthquakes. This evidence is now practically ready for publication, and perhaps this reference to it may be excused, partly because of its general interest, and partly to plead as above that though my attention has apparently been wandering from the better known variables, it has really been devoted to a cognate matter. In explanation of the length of time spent on a single "variable star," I would remark that instead of having many observations in a single cycle, there is only one earthquake in a good many cycles of 21 minutes. Hence no hint of the "light-curve" is given by the observations: it has to be inferred by laborious processes.

But to return to the volumes now properly dusted. In Volume XV., Col. Markwick wrote a "Preface" of half-a-dozen informative pages, but there was no "Introduction." This volume began the

century with the five years 1900-4. In Volume XVIII. (1905-9) Col. Markwick again wrote his Preface, and at his request I wrote a Note on T Cephei, starting from a curious difference between Rousdon and Harvard observations when the star is very red. There is now much new material for the study of this star, but I fear I have not as yet returned to the study. In Vol. XXII. (1910-14) the Preface was written by Mr. C. L. Brook, and at his request I added an Introduction ; and in Vol. XXV. (1915-1919) these features were repeated. Just after the former Introduction had been written, the Rev. T. E. R. Phillips made his Presidential Address, dividing the Variables into two classes, and Sir J. H. Jeans has suggested a physical interpretation of this undoubtedly significant division.

In contemplating a new Introduction for the present volume (1920-24) I am scarcely able, for the reasons above indicated, to follow up the lines of thought and work started in the previous ones. But this is the less to be regretted because the new Director of the Section, Mr. de Roy, has himself supplied in the Preface a far better review of recent progress than I should in any case have been able to make. Variable Stars have come into their own ; they are recognised as playing a fundamental part in stellar history, though we may not quite know as yet what that part is. The makers of this volume, and others who love to observe variable stars, need no longer fear that their work may be regarded as of minor value, as the Rev. W. R. Dawes regarded it in times past. (He tried to get Mr. George Knott to leave such work for double star measurement, as more worthy of a real astronomer.*). But as one consequence it requires more and more time to keep abreast of the subject in its various ramifications, especially the spectroscopic aspects of it, and it is a pleasure to see how carefully Mr. de Roy has collected the relevant information.

But I am nevertheless grateful for the opportunity of manifesting my continued interest in the work and my admiration for the amount and quality of it. And when I have added two remarks, I will ask permission to leave the matter there on the present occasion.

The first remark relates to the possibility of a greater refinement in observing which is still within the reach of the amateur. I make it with some hesitation as it might seem to imply dissatisfaction with what is already being done, which is very far from my intention. But if we may presume that greater accuracy is welcome provided the cost (in various senses) is not too great, I would call attention to the beautiful little instrument used at Strasbourg by M. Danjon,

* These words were written from memory. On looking up the reference I find the implication a little different. See *Observatory* for Oct., 1910, p. 395, lines 5 to 13, under date 3 Oct., 1863 :—

"I am heartily glad that you have not relinquished double-star measuring, for which, as you most justly say, your O.G. is so admirably suited. Indeed you will not wonder that, as I consider you possess in a very high degree the essential qualities of an accurate observer of these objects, I have felt not a little jealous of such a telescope and such an observer being mainly employed on variable stars, for which a vastly inferior telescope, to say nothing of the observer, would do as well.

and described in Vol. II. of the Strasbourg Observations. He uses quite a small telescope, of the type already in the possession of many observers, but he has fitted to it a prism and a "cat's-eye" (a simpler equivalent of an iris diaphragm) by means of which a neighbouring bright star may be reduced in brightness (by reduced aperture) to equality with the variable. It would take too long to describe the instrument in detail or to explain why it should be preferred to other forms of comparison-photometer; the real reason is the practical success of it and the full explanations can be found in the volume referred to. I hoped to be able to give some details as to cost, etc., but on enquiry I found that M. Danjon was away in Cochin China for observation of the Eclipse, so that the opportunity for giving this information must be deferred. But this brief note may perhaps lead those interested to look at Volume II. of the Strasbourg Observations.

The second remark is this. Alongside the B.A.A. Volumes collected as above were some monthly reports of the American Association of Variable Star Observers, which have pictures in them of the observers themselves. Why should not the B.A.A. Section have a picture every five years? Mr. Brook acknowledged with gratitude, in the last volume, an album of *celestial* photographs, but after all *terrestrial* photographs have an interest too. It is probably too late to adorn the present volume, but I hope there may be a good picture of the makers of the next volume, even if the "Introduction" has to be dropped to make up for the extra expense.

H. H. TURNER.

UNIVERSITY OBSERVATORY,
OXFORD, 1929, *July* 11.

(112) R ANDROMEDÆ. (V. 1.)

H.D. 001838.

As the magnitudes deduced from the photometric scale given in "Harvard Annals" 37., 198 do not in some cases suit the observations, the following magnitudes have again been adopted:—

Hagen's No.	Adopted Mag.	Hagen's No.	Adopted Mag.
25	10·00	40	12·0
28	11·04	54	13·5
37	11·73	55	13·7

For Hagen's 67, the magnitude 14·1 has been adopted.

The co-ordinates of the Comparison Star β are $\Delta\alpha - 18^s$, $\Delta\delta - 2'{\cdot}3$ with reference to the Variable. It is identical with Hagen's 60 ($14^m{\cdot}0$), but the value $13^m{\cdot}8$, previously adopted, is here retained.

Date.	Julian Date.	Inst.	Observer.	Comparisons.	Deduced Mag.
1920					
Jan					
1	2325	90	Bh	9−1	9·3
5	2329	,,	,,	9−2, 13+3, 15+5	9·2
8	2332	55	Bg	=15, 17+1	9·5
9	2333	30	D	13−2, 17+1	9·6*b*
13	2337	90	Bh	13−3	9·7
15	2339	45	Br	13−1	9·5
19	2343	50	Bn	17−1, =19	9·8
19	2343	79	Ma	=17	9·7
21	2345	,,	,,	17−1	9·8
21	2345	55	Bg	17−0·5, 19+1	9·7
21	2345	90	Bh	17−1	9·8
22	2346	30	D	19−1, 1+3	9·9
23	2347	90	Bh	13−5, 17−2	9·9
24	2348	79	Ma	15 (3) v (1) 17, 17+1	9·6
26	2350	160	Br	17−1	9·8
27	2351	90	Bh	17+1	9·6*b*
31	2355	,,	,,	=17	9·7*b*
31	2355	55	Bg	19−1, 22+3	9·9*b*
Feb					
4	2359	90	Bh	17−2	9·9
6	2361	160	Br	17−5	10·2
6	2361	30	D	21−1·5, 25+2	10·0
7	2362	55	Bg	=22	10·2
10	2365	90	Bh	17−5, 36+1·5	10·2
17	2372	,,	,,	17−10, 36+10	10·7
17	2372	183	Ma	17 (3) v (1) 37, 37+5	11·2
21	2376	79	,,	17 (7) v (1) 36, 40+6	11·4
21	2376	160	Br	28+3	10·7
22	2377	60	D	25−5	10·5*b*
23	2378	90	Bh	25−5, =28, 36+5	10·9
28	2383	,,	,,	25−10, 40+5	11·3
Mar					
2	2386	,,	,,	36+1, 37+1	11·6
7	2391	,,	,,	37−1, 40+1	11·9
11	2395	,,	,,	=40	12·0
18	2402	,,	,,	=40	12·0
18	2402	120	Br	37−3, 44+3	12·1
25	2409	90	Bh	40−3, =44	12·3

Feb. 22, Difficult.

Date.	Julian Date.	Inst.	Observer.	Comparisons.	Deduced Mag.
1920					
Apr					
9	2424	150	Bh	<44	<12·4
June					
11	2487	60	D	<33	<11·5*b*
July					
13	2519	75	Bg	<48	<13·4
17	2523	240	Br	<α	<13·9
19	2525	120	Bn	<48	<13·4
Aug					
8	2545	240	Br	α−2	14·1
15	2552	130	Mn	<β	<13·8
19	2556	240	Br	α−2	14·1
26	2563	130	Mn	<48	<13·4
Sept					
4	2572	,,	,,	<β	<13·8
10	2578	240	Br	α−1	14·0
13	2581	90	Bh	=48	13·4*b*
16	2584	,,	,,	=48	13·4*b*
18	2586	150	Bn	<48	<13·4
18	2586	130	Mn	α−1·5	14·1*b*
19	2587	75	Bg	<48	<13·4
20	2588	240	Br	α−1	14·0
21	2589	90	Bh	=48	13·4*b*
25	2593	,,	,,	43−2, 48+2	13·1
Oct					
2	2600	,,	,,	40−10, 44−5	12·9
6	2604	,,	,,	40−6, 44−3	12·6
6	2604	120	Br	α+5	13·4
6	2604	130	Mn	48−3, 53+1	13·7*b*
12	2610	90	Bh	40−4, =44	12·4
12	2610	60	Mn	44−1·5, 47+0·5	12·6*b*
18	2616	90	Bh	40−2	12·2
19	2617	75	Bg	35−2, 40+2	11·8*b*
20	2618	120	Br	37−3	12·0
20	2618	,,	Bn	30 (3) v (1) 37	11·6

April 9, July 19, Not seen.
August 8, 19, Glimpsed.
Sept. 13, 16, Very difficult.
Sept. 20, Glimpsed.
Sept. 21, Very difficult.

(112) R ANDROMEDÆ—*continued.*

1920 Oct					
20	2618	130	Mn	=35	11·6
25	2623	90	Bh	37+5	11·2
28	2626	32	Mn	21 (1) v (2) 23	10·1*b*
29	2627	90	Bh	=22, =24	10·3
30	2628	55	Bg	19−1·5, 24+4	9·9
Nov					
1	2630	50	Bn	19 (1) v (3) 22	9·9
1	2630	90	Bh	17+2	9·5
3	2632	55	Bg	13−2, 15−1, 17+1	9·6*b*
3	2632	32	Mn	=17	9·7*c*
6	2635	50	Bn	15 (1) v (1) 19	9·7
10	2639	90	Bh	7−5, 13+2, 17+5	9·2
11	2640	B	Mn	13−2, 17+1	9·6*b*
12	2641	55	Bg	9−1, 13+1	9·3*b*
12	2641	79	Ma	13+1, 17+5	9·2
13	2642	45	Br	7−2·5, 13+5	8·9
15	2644	90	Bh	7+2	8·5
16	2645	30	D	1−1, 9+2	9·0
18	2647	55	Bg	=9	9·2
18	2647	32	Mn	7 (1) v (3) 9	8·8
18	2647	90	Bh	5−4, 7+2	8·6
21	2650	,,	,,	5−2, 7+2	8·5
21	2650	50	Bn	6 (2) v (1) 9, 7 (2) v (1) 9	9·0
21	2650	,,	Ma	=7	8·7
30	2659	45	Bh	5−1, 7+3	8·4
Dec					
1	2660	55	Bg	6−3, 9+2	9·0
1	2660	50	Bn	7 (1) v (2) 9	8·9
3	2662	32	Mn	6+0·5	8·6*b*
8	2667	45	Br	5−2, 7+2	8·5
10	2669	90	Bh	5−1, 7+1	8·5*b*
12	2671	32	Mn	5 (3) v (2) 7	8·5
17	2676	90	Bh	=5, 6+5, 7+5	8·2
21	2680	,,	,,	5+1	8·2
21	2680	32	Mn	5+1·5	8·1*b*
22	2681	55	Bg	6−1, 9+4	8·8*b*
26	2685	90	Bh	5+2	8·1
28	2687	55	Bg	5−2, 6+1	8·5
28	2687	30	Bn	5 (1) v (1) 7	8·5
31	2690	45	Br	=5	8·3
31	2690	90	Bh	5+2	8·1
1921 Jan					
2	2692	,,	,,	5+2	8·1
6	2696	,,	,,	5+2	8·1
7	2697	80	Ca	1−1, 9+1	9·1
12	2702	32	Mn	5 (4) v (1) 7	8·6*b*
13	2703	45	Br	6−1, 7−1	8·8
13	2703	,,	Bh	5+1, 6+5, 7+6	8·1
15	2705	30	Bn	5 (2) v (1) 7	8·6
15	2705	90	Bh	5−1, 6+3, 7+4	8·3
16	2706	30	D	6−3, 1+2	8·9
21	2711	45	Bh	6+1, 7+1	8·6*b*
30	2720	90	,,	=7	8·7
30	2720	80	Ca	13−1, =15, 17+2	9·5
30	2720	30	D	6−3, 1+1, 9+4	8·9
31	2721	50	Bn	7 (4) v (1) 9	9·1*b*
Feb					
2	2723	55	Bg	9−1, 13+1	9·3*b*
2	2723	90	Bh	=7	8·7
2	2723	79	Ma	17+2	9·5
2	2723	32	Mn	7−1	8·8
3	2724	45	Br	=13	9·4
9	2730	90	Bh	6+1, 7+1	8·6

Nov. 21, Ma, About.

1921 Feb					
17	2738	160	Br	13−1, 17+1	9·
20	2741	50	Bn	13−1, 15+1	9·
20	2741	32	Mn	9 (1) v (1) 13	9·
20	2741	90	Bh	=13, =15	9·
24	2745	32	Mn	15+1	9·
25	2746	90	Bh	13−2, =15, 17+2	9·
27	2748	80	Ca	17−1, =19, 1+4	9·
27	2748	50	Ma	17+2	9·
Mar					
2	2751	65	Bg	17−2, 19−1, 24+4	9·
2	2751	32	Mn	15 (1) v (1) 17	9·
2	2751	90	Bh	13−2, 17+1	9·
7	2756	,,	,,	17+1	9·
10	2759	,,	,,	=17	9·
17	2766	,,	,,	17−4, 22+1	10·
18	2767	32	Mn	17−4, 23+1	10·
20	2769	45	Br	28−3	11·
24	2773	,,	Bh	17−5, =22	10·
Apr					
1	2781	90	,,	22−8, =28	11·
12	2792	,,	,,	=28	11·
28	2808	,,	,,	37+3, 40+6	11·
May					
7	2817	,,	,,	=40	12·
24	2834	150	,,	40−2	12·
30	2840	157	Wf	<55	<13·
June					
2	2843	150	Bh	=40	12·
7	2848	90	Mn	β−1	13·
27	2868	120	Br	<44	<12·
27	2868	150	Bh	40−5, 44−1	12·
July					
5	2876	110	Bg	<40	<12·
8	2879	150	Wf	<α	<13·
16	2887	,,	,,	<53	<13·
18	2889	,,	Bh	=48	13·
26	2897	,,	Wf	<53	<13·
29	2900	90	Bh	<43	<12·
31	2902	120	Br	α−2	14·
31	2902	231	Wf	Much <α	<13·
Aug					
6	2908	96	Gr	<53	<13·
8	2910	120	Br	α−2	14·
8	2910	231	Wf	Much <α	<13·
16	2918	90	Bh	<43	<12·
25	2927	96	Gr	<55	<13·
25	2927	157	Wf	=53	13·
30	2932	120	Br	<α	<13·
Sept					
1	2934	30	D	<44	<12·
5	2938	120	Br	α−3	14·
12	2945	150	Wf	53−3, α+2	13·
23	2956	,,	,,	53 (1) v (1) α	13·
24	2957	120	Br	β+5	13·
26	2959	96	Gr	=53	13·

May 30, Estimated 14·0 mag. Seen fairly easil
June 27, Br, Not seen.
July 8, Seen. Estimated 14·2. Very difficul
July 16, 26, 29, Invisible.
July 31, Br, Glimpsed. Wf, Glimpsed. Es
timated 14·5.
Aug. 6, Invisible.
Aug. 8, Br, Difficult. Wf, Invisible.
Aug. 16, Invisible.
Aug. 30, Not seen. Difficult.
Sept. 5, About. Glimpsed. Difficult.

(112) R ANDROMEDÆ—*continued.*

1921					
Sept.					
28	2961	120	D	44−3	12·7*b*
29	2962	180	Bg	44−2	12·6*b*
30	2963	90	Bh	48+2	13·2
Oct.					
4	2967	150	Wf	44 (1) v (1) 47	12·5
5	2968	96	Gr	=37	11·7
6	2969	75	Bg	40−2, 44+2	12·2
6	2969	120	Bn	40 (2) v (1) 44	12·3
16	2979	75	Bg	37−2, 40+1	11·9
17	2980	120	Br	37−1	11·8
18	2981	96	Gr	=35	11·6
20	2983	,,	,,	=33	11·5
21	2984	62	Wf	=31	11·2
23	2986	50	Bn	24 (4) v (1) 30	11·0
25	2988	90	Bh	40+3	11·7*b*
29	2992	160	Br	28−2, 37+4	11·3
30	2993	32	Ca	25−8, 40+2	11·3
30	2993	96	Gr	25−3	10·3
31	2994	90	Bh	22−10, 25−5	10·8
Nov.					
2	2996	62	Wf	=28	11·0
6	3000	55	Bg	22−7, 28+1	10·9
6	3000	160	Br	28+3	10·7
6	3000	50	Bn	19 (3) v (1) 22	10·1
7	3001	32	Ca	25−6, 40+3·5	11·1
12	3006	90	Bh	22+2, 25+6	9·7
17	3011	96	Gr	=17	9·7
18	3012	32	Ca	17−1, 1+4	9·8
22	3016	55	Bg	13−1, 17+1·5	9·5
23	3017	50	Bn	13−1, 15+1	9·5
26	3020	90	Bh	5−2, 6+2	8·4*b*
27	3021	45	Br	=7	8·7
27	3021	50	Bn	6 (2) v (1) 9	9·0
29	3023	55	Bg	=13	9·4*b*
29	3023	90	Bh	3−10, 6+5	8·0
30	3024	96	Gr	17+10	8·7
Dec.					
3	3027	90	Bh	3−8, 7+8	7·8
4	3028	45	,,	3−7, 5+7, 7+10	7·6*b*
7	3031	30	Bg	4−2, 5+3·5	7·9*b*
13	3037	62	Wf	3−1, 2+4	7·0*b*
15	3039	90	Bh	3−3	7·2
17	3041	30	Bg	3−2	7·1
20	3044	,,	Bn	2 (1) v (1) f	7·5
21	3045	96	Gr	3−4	7·3
21	3045	90	Bh	3−1	7·0
22	3046	30	Bg	3−2	7·1*b*
23	3047	45	Br	3+1	6·8
23	3047	90	Bh	=3	6·9
25	3049	,,	,,	3+2	6·7
27	3051	96	Gr	3−4	7·3
28	3052	30	Bg	3−1	7·0
28	3052	,,	Bn	3 (1) v (2) 2	7·1
29	3053	90	Bh	3−1	7·0
29	3053	50	Ma	3 (1) v (2) 13	7·8
30	3054	F	Wf	4−1, 5+4	7·9
31	3055	30	Bn	3 (1) v (2) 2	7·1
1922					
Jan.					
3	3058	45	Br	=3	6·9
3	3058	30	Bn	3−1	7·0
3	3058	90	Bh	3−1	7·0
8	3063	,,	,,	=3	6·9
9	3064	62	Wf	2−1	7·5
10	3065	30	Bn	3 (2) v (1) 2	7·2
10	3065	,,	D'	2−1, f+2	7·5
10	3065	90	Bh	3−2	7·1
16	3071	F	Bg	3−1, 2+3	7·0
16	3071	30	Bn	3 (3) v (1) 2	7·2
16	3071	79	Ma	3−1	7·0
17	3072	F	Wf	4−1, 5+4	7·9
18	3073	90	Bh	3−1	7·0
21	3076	,,	,,	3−2	7·1
21	3076	45	Br	3−4	7·3
23	3078	F	Wf	4−3, 7+5	8·1*b*
28	3083	50	Ma	3−1	7·0
29	3084	90	Bh	3−7, 5+7	7·6
31	3086	F	Wf	4−1, 5+4	7·9
Feb.					
1	3087	30	Bg	2−4, 5+5	7·8
2	3088	90	Bh	5+3, 6+5	8·1
4	3090	70	Gr	3−5	7·4*b*
5	3091	90	Bh	3−10, 5+3, 6+5	8·0
9	3095	55	Bg	2−6, 5+3·5	7·9
9	3095	25	Bn	f (3) v (1) g	8·0
10	3096	90	Bh	3−12, 6+5	8·1
12	3098	30	D	g−1, 5+2	8·2*b*
17	3103	90	Bh	=5, 6+2	8·4
17	3103	50	Ma	3 (4) v (1) 13, 13+6	8·9
18	3104	45	Br	=5	8·3
18	3104	50	Bn	f (3) v (1) g	8·0
19	3105	62	Wf	4 (1) v (1) 5	8·0*b*
20	3106	70	Gr	3−10	7·9*b*
21	3107	32	Ca	5−3, =6	8·6*b*
23	3109	70	Gr	=6	8·7
25	3111	50	Bn	g (4) v (1) 5	8·3
26	3112	45	Bh	=6, =7	8·7*b*
28	3114	62	Wf	=7	8·7
Mar.					
4	3118	45	Br	6+1, 7+1	8·6
4	3118	30	Bn	6 (1) v (3) 9, 7+1	8·7
4	3118	90	Bh	6−3, 7−1	8·9*b*
9	3123	48	Bg	9−0·5, 13+2	9·2*b*
10	3124	62	Wf	7 (1) v (1) 9, =8	8·9
19	3133	90	Bh	=6, =7	8·7*b*
22	3136	62	Wf	8−2, =9	9·1*b*
28	3142	90	Bh	6−5, 7−3	9·1*b*
29	3143	62	Wf	13−0·5, 15+1	9·4*b*
31	3145	90	Bh	=13, 17+3	9·4*b*
April					
17	3162	,,	,,	17+1	9·6
19	3164	62	Wf	19−3, 22+1	10·1
23	3168	90	Bh	17−1	9·8
29	3174	62	Wf	23−2	10·5
May					
2	3177	90	Bh	17 (1) v (3) 36	10·2
8	3183	,,	,,	17 (2) v (3) 36	10·5
14	3189	150	Wf	=33, 37+2	11·5
21	3196	157	,,	37−1, 40+2	11·8
27	3202	90	Bh	17 (3) v (1) 36	11·1
29	3204	150	Wf	37−2, 40+1	11·9
June					
17	3223	,,	,,	48−1, 53+3	13·5
24	3230	157	,,	48−2, 53−1, a+3	13·7
26	3232	90	Bh	40−2	12·2*b*

Sept. 28, Difficult.
Oct. 4 and 21, 9-in.
Oct. 25, Unsteady.
Nov. 2, 6-in.

Jan. 16, Ma, Pale red.
Jan. 28, Reddish.
Feb. 17, Ma, Dull, pale red.
Feb. 20, About.
Mar. 22, Not certain.

(112) R ANDROMEDÆ—*continued.*

1922					
July					
10	3246	240	Br	<44	<12·4
10	3246	150	Bh	40−5	12·5
23	3259	157	Wf	α−3, =67	14·2
27	3263	150	Bh	40−10	13·0
30	3266	240	Br	α−2	14·1
30	3266	157	Wf	<67	<14·1
Aug					
12	3279	150	Bh	<48	<13·4
14	3281	157	Wf	<67	<14·1
16	3283	75	Bg	<48	<13·4
17	3284	90	Gr	<53	<13·8
17	3284	231	Wf	67−3	14·4
18	3285	120	Br	α−1	14·0
23	3290	240	,,	α−4	14·3*b*
23	3290	231	Wf	67−3	14·4
26	3293	180	Bg	=53	13·8*b*
Sept					
7	3305	60	Bh	48−6, 53−3	14·0
11	3309	231	Wf	67−4	14·5
15	3313	240	Br	< (α−2)	<14·1
16	3314	231	Wf	67−5	14·6
18	3316	60	Bh	48−5	13·9
20	3318	110	Bg	=53	13·8
21	3319	150	Bh	<48	<13·4
23	3321	157	Wf	<67	<14·1*b*
26	3324	60	Bh	48−8, 53−4	14·2
Oct					
4	3332	,,	,,	48−6, 53−4	14·1
7	3335	,,	,,	48−10, 53−5	14·3
11	3339	231	Wf	<67	<14·1
13	3341	60	Bh	53−2, 48−6	14·0
14	3342	120	Br	<β	<13·8
14	3342	231	Wf	67−5	14·6
17	3345	,,	,,	<67	<14·1
21	3349	60	Bh	40−15	13·5
25	3353	150	,,	48−5	13·9
Nov					
9	3368	90	,,	<48	<13·4
11	3370	120	Br	α−2	14·1*b*
11	3370	150	Lp	<48	<13·4*b*
14	3373	90	Bh	=48	13·4
17	3376	157	Wf	67−1	14·2
19	3378	90	Bh	=48	13·4
24	3383	,,	,,	40−10, 48+3	13·0
24	3383	120	Br	<α	<13·9
24	3383	150	Lp	<54	14·0*b*

July 10, Br, Not seen.
July 30, Br, About. Just seen.
Wf, Invisible.
Aug. 12, Not seen.
Aug. 14, Suspected.
Aug. 16, Perhaps glimpsed.
Aug. 18, Just seen.
Aug. 23, Br, Just glimpsed.
Aug. 26, About. Certainly glimpsed.
Sept. 15, Perhaps glimpsed.
Sept. 16, Difficult.
Sept. 20, About.
Sept. 21, Not seen.
Oct. 11, Invisible.
Oct. 14, Br, Not seen. Wf, Glimpsed.
Oct. 17, Invisible.
Oct. 21, Glimpsed.
Nov. 9, Not seen.
Nov. 11, Br, Glimpsed. Lp, Not seen.
Nov. 24, Br, Not seen. Lp, Glimpsed.

1922					
Dec					
6	3395	150	Bh	40−10, 43−3	13·
11	3400	90	,,	40−8, =43	12·
16	3405	150	,,	=43	12·
16	3405	75	Bg	<46	<12·
18	3407	90	Bh	40−10, 48+3	13·
19	3408	240	Br	β+4	13·
20	3409	150	Lp	48−5	13·
23	3412	110	Bg	44−5, 46−3	12·
23	3412	150	Lp	48−4	13·
25	3414	90	Bh	40−8	12·
28	3417	,,	,,	40−10, =43	12·
1923					
Jan					
4	3424	,,	,,	37−1, 40+1	11·
6	3426	,,	,,	36+1, 37+1, 40+5	11·
10	3430	75	Bg	35−3, 40+1	11·
11	3431	90	Bh	36+3, 37+4	11·
14	3434	,,	,,	17−12, 36+8	10·
14	3434	160	Br	=37	11·
14	3434	75	Bn	=30	11·
14	3434	100	Lp	=28	11·
14	3434	94	Li	28 (5) v (5) 30	11·
15	3435	75	Bg	=28, 30+1	11·
16	3436	100	Lp	25 (2) v (2) 28	10·
18	3438	79	Ma	37+5	11·
19	3439	90	Bh	17−6, 22−1	10·
20	3440	,,	,,	17−2	9·
20	3440	100	Lp	=22	10·
20	3440	79	Ma	17−2	9·
20	3440	62	Wf	=24	10·
23	3443	100	Lp	17 (1) v (2) 21	9·
23	3443	44	Li	=17	9·
24	3444	50	Bn	15 (1) v (1) 19	9·
30	3450	45	Bh	=13, =15, 17+2	9·
Feb					
2	3453	,,	,,	9−1, 13+2	9·
4	3455	50	Bn	6−1, =7	8·
4	3455	100	Lp	=13	9·
5	3456	45	Br	7−3, 9+1·5	9·
6	3457	31	D	6−3, 1+1	8·
7	3458	62	Wf	7−5, 9+1	9·
8	3459	90	Bh	7−3, 9+3	8·
8	3459	37	Lp	7 (1) v (2) 13, =9	9·
11	3462	,,	,,	7 (2) v (2) 9	8·
11	3462	50	Bn	5 (3) v (1) 6	8·
18	3469	48	Bg	5−2, 6+1	8·
18	3469	37	Lp	5+1	8·
21	3472	,,	,,	4 (2) v (1) 5	8·
23	3474	45	Bh	3−10, 5+2	8·
25	3476	90	,,	5+3	8·
26	3477	48	Bg	=5	8·
Mar					
2	3481	90	Bh	3−9, 5+3	7·
4	3483	50	Bn	4 (4) v (1) 5	8·
4	3483	37	Lp	4 (2) v (1) 5	8·
5	3484	45	Bh	3−7, 5+7	7·
13	3492	,,	,,	3−9, 5+4	7·
17	3496	90	,,	3−10, 5+3	8·
21	3500	45	,,	3−9, 5+4	7·
25	3504	90	,,	3−10, 5+5	7·
27	3506	,,	,,	3−12, 5+3	8·
Apr					
13	3523	,,	,,	=9, 13+1	9·
14	3524	,,	,,	7−3, 9+1, 10+3	9·

Dec. 16, Bg, Glimpsed.
Dec. 23, Bg, About. Lp, Seen by flashes.
Jan. 14, Lp, White.

(112) R ANDROMEDÆ—*continued.*

1923					
May					
3	3543	90	Bh	=9	9·2
6	3556	,,	,,	17−1	9·8
30	3570	,,	,,	15−5, 17−3	10·0
June					
3	3574	,,	,,	17−5	10·2
5	3576	62	Wf	22−1, 24+1	10·3*b*
1	3582	90	Bh	17−9	10·6
1	3582	150	Lp	=37	11·7*b*
8	3589	90	Bh	17−12, 36+8	10·9
22	3593	150	Lp	=37	11·7*b*
July					
1	3602	90	Bh	36+5, 37+4	11·2
5	3606	157	Wf	40−2, 44+2	12·2
6	3607	150	Lp	=40	12·0*b*
8	3609	,,	,,	40 (1) v (2) 44	12·1
8	3609	120	Bn	=40	12·0
3	3614	150	Lp	40 (4) v (1) 44	12·3*b*
8	3619	157	Wf	40−5, 44−1	12·5
0	3621	150	Lp	44−2	12·6*b*
0	3621	90	Bh	40+2	11·8
1	3622	94	Li	<40	<12·0*b*
1	3632	90	Bh	40−5	12·5
Aug.					
3	3635	120	Br	44−5	12·9*b*
4	3636	150	Bh	40−7	12·7
5	3637	157	Wf	48−5, =53	13·8
6	3638	,,	,,	=55, *a*+2	13·7
8	3640	110	Bg	<48	<13·4
9	3641	150	Bh	40−8	12·8
2	3644	,,	Lp	<48	<13·4*b*
2	3644	231	Wf	*a*+1	13·8
5	3647	120	Bn	<53	<13·8
5	3647	90	Bh	40−10	13·0
2	3654	,,	,,	40−10, 43−5, =48	13·2
6	3658	150	,,	=48	13·4*b*
Sept.					
3	3666	231	Wf	*a*−1, 67+1	14·0
7	3670	240	Br	*a*−1, *β*−1	14·0
8	3671	157	Wf	*a*−2, =67	14·1
2	3675	300	,,	67−2	14·3
5	3678	150	Bn	<53	<13·8
6	3679	OG	Ph	53−5	14·3*b*
0	3693	120	Br	*a*−3, *β*−3	14·2
Oct.					
9	3702	,,	,,	*a*−3, *β*−3	14·2
9	3702	157	Wf	<67	<14·1
4	3707	OG	Ph	67−1	14·2
0	3723	157	Wf	67−5·5	14·7
1	3724	120	Br	<*a*	<13.9*b*
Nov.					
3	3727	150	Lp	<48	<13·4*b*
4	3728	120	Br	*a*−5, *β*−5	14·4*b*
7	3731	OG	Ph	*a*−2	14·1
0	3734	150	Bn	<48	<13·4
Dec.					
3	3757	120	Br	*a*−3	14·2

Aug. 3, About.
Aug. 8, Certainly glimpsed.
Aug. 12, Lp, Not seen.
Aug. 15, Bn, Seen.
Sept. 15, Not seen.
Sept. 30, Glimpsed.
Oct. 9, Wf, Invisible.
Oct. 31, Nov. 3, 10, Not seen.
Nov. 4, About. Just glimpsed.
Dec. 3, Br, Perhaps glimpsed.

1923					
Dec.					
3	3757	OG	Ph	Estimated	<14·6
28	3782	150	Bh	48−1	13·5*b*
1924					
Jan.					
3	3788	120	Br	*β*+4	13·4
3	3788	90	Bh	48+1	13·3*b*
6	3791	110	Bg	=46	12·6
9	3794	150	Wf	48−1, 49−2	13·5
12	3797	80	D	40−4	12·4*b*
16	3801	90	Bh	40−10, 43−2	13·0
19	3804	150	Wf	35−3, =45	11·9
25	3810	120	Bn	40 (1) v (3) 44	12·1
25	3810	160	Br	=35	11·6
27	3812	94	Bl	30 (2) v (2) 34	11·3
27	3812	80	Ca	=40	12·0
28	3813	,,	D	37−3, 40+1	12·0*b*
31	3816	90	Bh	34+2	11·3
Feb.					
1	3817	OG	Ph	17 (3) v (1) 36, 36+5	11·1
1	3817	80	D	37+2	11·5
1	3817	150	Wf	=33, 35+2	11·4
1	3817	120	Bn	30 (1) v (3) 37	11·3
2	3818	150	Lp	=30	11·2*b*
4	3820	90	Bh	17 (3) v (1) 34	11·1*b*
5	3821	32	Ca	=28	11·0
8	3824	100	Lp	21 (2) v (2) 24	10·2*b*
8	3824	62	Wf	=25, 24+2·5	10·0
11	3827	90	Bh	17−5, 25+4	9·9
13	3829	40	D	15 (5) v (3) 25	9·8*b*
13	3829	32	Ca	19 (2) v (6) 25	9·9
14	3830	94	Bl	=17	9·7
16	3832	50	Bn	15 (3) v (2) 19	9·7
18	3834	90	Bh	17+1	9·6
19	3835	62	Wf	13−3, 17+1	9·6
19	3835	32	Ca	=15	9·5
20	3836	94	Bl	=12	9·3
21	3837	90	Bh	9−1, 17+3	9·3
22	3838	32	Ca	=15	9·5
23	3839	40	D	9+4	8·8
24	3840	50	Bn	=9	9·2
24	3840	45	Br	13+4	9·0
24	3840	90	Bh	9+1	9·1
25	3841	,,	,,	7 (1) v (1) 9	8·9
26	3842	,,	,,	=7	8·7
26	3842	32	Ca	1−2, =9	9·2
27	3843	,,	,,	1 (1) v (1) 9	9·1
28	3844	F	Wf	7−1, 8+2	8·7
28	3844	22	Bl	=7	8·7
28	3844	90	Bh	5−1, 7+3	8·4
Mar.					
1	3846	,,	,,	5+2, 7+5	8·1
2	3847	32	Ca	=5	8·3
4	3849	50	Bn	4 (5) v (1) 5	8·2
4	3849	40	D	f−4, g+1	8·1
4	3849	45	Bh	4 (1) v (1) 5	8·0
5	3850	F	Wf	4−4, 5+1	8·2*b*
5	3850	32	Ca	2 (3) v (1) f	7·6
7	3852	45	Bh	3 (3) v (1) 5	8·0
7	3852	32	Ca	2 (3) v (1) f	7·6
7	3852	50	Bn	2 (3) v (1) f	7·6
7	3852	26	Bg	4 (1) v (3) 5	7·9
8	3853	40	D	f+1	7·6

Dec. 3, Ph, Invisible. Dec. 28, Glimpsed.
Jan. 3, Br, 6, About.
Jan. 12, Difficult.
Mar. 4, 14, D, 4c.
Mar. 8, 9, D, 5c.

(112) R ANDROMEDÆ—*continued.*

1924					
Mar					
9	3854	30	D	2−4, f+1	7·7
9	3854	50	Bn	2 (2) v (1) f	7·6
9	3854	45	Bh	3−5	7·4
10	3855	32	Ca	2 (2) v (2) f	7·5
11	3856	25	Bn	2 (1) v (3) f	7·4
11	3856	40	D	2−1, f+3	7·4
13	3858	32	Ca	3 (3) v (1) 2	7·2
14	3859	40	D	2+1	7·3
15	3860	90	Bh	3−2	7·1
19	3864	,,	,,	3−2	7·1
19	3864	25	Bn	3 (3) v (1) 2	7·2
22	3867	90	Bh	3+2	6·7
23	3868	31	D	3−2, 2+3	7·1
24	3869	45	Bh	3+2	6·7
26	3871	90	,,	3+4	6·5
29	3874	,,	,,	3+2	6·7
30	3875	31	D	c−3, 3+2	6·7
Apr					
2	3878	45	Bh	3+4	6·5
4	3880	90	,,	3+5, 2+8	6·5
5	3881	40	D	3+2	6·7
6	3882	31	,,	c−4, 3+2	6·8
6	3882	90	Bh	3+3	6·6
8	3884	,,	,,	3+3	6·6
11	3887	,,	,,	3+3	6·6
14	3890	,,	,,	3+1	6·8
16	3892	,,	,,	=3	6·9
24	3900	45	,,	3−3, 5+10	7·3
26	3902	,,	,,	5+10	7·3
May					
3	3909	,,	,,	3 (1) v (1) 5	7·6
5	3911	,,	,,	3 (2) v (1) 5	7·8
10	3916	,,	,,	3−8, 5+5	7·8
14	3920	,,	,,	4 (1) v (1) 5	8·0
25	3931	90	,,	5 (2) v (1) 6	8·5
27	3933	22	Bl	4 (5) v (1) 5	8·2
31	3937	62	Wf	7 (1) v (3) 8	8·7
31	3937	90	Bh	6−3, 9+2	9·0
June					
4	3941	,,	,,	9+1	9·1
5	3942	22	Bl	4 (6) v (1) 5, =5	8·2*b*
7	3944	62	Wf	7−2, 9+3	8·9
11	3948	45	Bh	=6, =7	8·7*b*
14	3951	90	,,	5−3, =7	8·6
19	3956	,,	,,	=9	9·2
22	3959	62	Wf	13+1, 17+4	9·3
23	3960	45	Bh	9−2	9·4
23	3960	100	Lp	=9	9·2
26	3963	30	D	6−6, 11+2	9·2
27	3964	90	Bh	9−2, 15+1	9·4
28	3965	62	Wf	13+1, 17+4	9·3
29	3966	22	Bl	9 (2) v (1) 13	9·3
July					
1	3968	90	Bh	13 (1) v (1) 17, =15	9·5
3	3970	,,	,,	17+1	9·6
3	3970	62	Wf	=13, 17+3	9·4
4	3971	40	Wb	=17	9·7
5	3972	90	Bh	17+1	9·6
7	3974	30	D	11−2, 17+1	9·6
8	3975	62	Wf	13−5, =17	9·8
9	3976	30	D	=17	9·7
9	3976	90	Bh	17−1	9·8
10	3977	20	Wb	=17	9·7
10	3977	94	Bl	12 (1) v (2) 17, =12	9·4
11	3978	32	Ca	19 (2) v (6) 25	9·9

April 16, May 3, June 11, Orange.
July 4, 10, Wb, t.

1924					
July					
13	3980	50	Bn	19 (3) v (1) 22	10·
14	3981	90	Bh	17−3	10·
20	3987	62	Wf	17−3, 22+4	9·
24	3991	231	Wf	17−5, 22+1	10·
24	3991	100	Lp	17 (2) v (1) 25	9·
25	3992	40	Wb	=25	10·
27	3994	62	Wf	17−5, =25	10·
30	3997	50	Bn	19−5, 24+1	10·
Aug					
4	4002	62	Wf	25−5, 28+3	10·
8	4006	50	Wb	28 (2) v (3) 30	11·
9	4007	94	Bl	28+2	10·
10	4008	62	Wf	24−4, 28+2	10·
15	4013	90	Bh	37 (1) v (2) 40	11·
19	4017	,,	,,	36 (1) v (1) 40	11·
19	4017	50	Wb	=35	11·
19	4017	120	Br	37+2	11·
19	4017	75	Bg	37 (2) v (1) 40	11·
22	4020	62	Wf	=37, 40+2	11·
26	4024	120	Bh	40−1	12·
27	4025	,,	D	37−2, 40+1	11·
27	4025	62	Wf	=40	12·
28	4026	80	Ca	40 (1) v (3) 45	12·
31	4029	75	Bg	40 (1) v (1) 44	12·
31	4029	150	Lp	40 (2) v (2) 44, 40−2	12·
31	4029	157	Wf	40−0·5	12·
Sept					
2	4031	90	Bh	40+1	11·
6	4035	94	Bl	=40	12·
7	4036	157	Wf	40−3, 44+1	12·
16	4045	90	Bh	40−5, =44	12·
17	4046	94	Bl	45 (2) v (4) 46	12·
22	4051	75	Bg	<44	<12·
22	4051	60	D	40−1	12·
23	4052	50	Wb	=44	12·
24	4053	90	Bh	43+1	12·
26	4055	157	Wf	43−1, 44−6	13·
27	4056	120	Bh	=43	12·
27	4056	,,	Br	44−6	13·
29	4058	94	Bl	=55	13·
Oct					
1	4060	172	Ha	55 (2) v (1) *a*	13·
1	4060	130	Ma	44−2, *β*+5	12·
2	4061	150	Bh	40−10, 48+3	13·
4	4063	172	Ha	55 (1) v (1) *a*	13·
5	4064	157	Wf	48−6, *a*+0·5	13·
11	4070	150	Bh	<43	<12·
18	4077	172	Ha	55 (2) v (1) *a*	13·
23	4082	120	Br	=*a*	13·
24	4083	94	Bl	Estimated	<14·
24	4083	172	Ha	=*a*	13·
26	4085	157	Wf	*a*−2	14·
31	4090	120	Bh	48−3, =55	13·
Nov					
3	4093	,,	Br	*a*−2	14·
3	4093	94	Li	<55	<13·
4	4094	,,	Bl	Estimated	<14·
4	4094	172	Ha	<*a*	<13·
5	4095	120	Bh	=55, =57, =58	13·
15	4105	94	Bl	Estimated	<13·
16	4106	172	Ha	*a*−10	14·

July 25, T.
Oct. 11, Not seen.
Oct. 23, About. Glimpsed. Difficult.
Nov. 3, Br, About. Glimpsed.
Nov. 4, Ha, Invisible.
Nov. 16, 30, Ha, About.

(112) R ANDROMEDÆ—*continued.*

Date.	Julian Date.	Inst.	Observer.	Comparisons.	Deduced Mag.
1924 Nov					
24	4114	120	Bh	=59	13·9
29	4119	231	Wf	...	14·8
29	4119	120	Bh	59−2	14·1
30	4120	172	Ha	a−10	14·9*b*
30	4120	150	Bk	<69	<14·6
Dec					
2	4122	,,	,,	<69	<14·6
6	4126	120	Bh	<58	<13·8
12	4132	150	Bk	<69	<14·6
14	4134	,,	,,	69−3	14·9
16	4136	172	Ha	a−2	14·1
17	4137	150	Bk	<69	<14·6
19	4139	120	Bh	=65, =68	14·5
20	4140	150	Bk	<69	<14·6
24	4144	,,	,,	69−5	15·1
25	4145	120	Bh	=65	14·4
28	4148	172	Ha	a−5	14·4
30	4150	120	Bh	=65	14·4

Nov. 29, Wf, Estimate made from two stars rated 14·5 and 14·7, not shown on Hagen's chart. Approximate positions :— 14·5, -7^s $-0'$; 14·7, $0^s+0'·7$.
Nov. 30, Bk, Invisible.
Dec. 2, Glimpsed at intervals.
Dec. 6, Not seen.

Dec. 12, Invisible.
Dec. 14, Very Difficult.
Dec. 17, 20, Just seen at intervals.
Dec. 28, Difficult.

(787) W ANDROMEDÆ. (V. 6.)

H.D. 021143a.

Star B = Parkhurst's w, estimated $13^m·5$ = Hagen's 66.
,, C = ,, z, ,, 13·8 = ,, 67.
Hagen's 71 = ,, y, ,, 13·8
,, 74 = ,, a, ,, 14·1

(Cf. *Researches in Stellar Photometry*, by John A. Parkhurst, page 47).
The star styled A in B.A.A. Memoirs XXII. and XXV. is identical with Hagen's 2.

Date.	Julian Date.	Inst.	Observer.	Comparisons.	Deduced Mag.
1920 Jan					
8	2332	75	Bg	55−5	13·4
9	2333	94	Ni	55 (2) v (1) B	13·3
15	2339	240	Br	55−6	13·5
24	2348	110	Bg	55−5	13·4
26	2350	240	Br	55−10	13·9*b*
Feb					
5	2360	94	Ni	B−2·5	13·8*b*
7	2362	75	Bg	55−4	13·3
15	2370	94	Ni	55−4	13·3
16	2371	240	Br	55−8	13·7
17	2372	94	Ni	B−3	13·8
18	2373	75	Bg	55−5	13·4
20	2375	150	Tn	<55	<12·9
Mar					
2	2386	,,	,,	<55	<12·9*b*
8	2392	94	Ni	...	<14·0
10	2394	150	Tn	<55	<12·9
15	2399	94	Ni	...	<13·8
17	2401	...	Tn	55−10	13·9
23	2407	90	Bh	<55	<12·9
28	2412	94	Ni	...	<13·2
Apr					
9	2424	90	Bh	<40	<11·7*b*
16	2431	120	Br	=55	12·9*b*
16	2431	94	Ni	54 (5) v (1) 55	12·8
May					
4	2449	150	Bh	40−10	12·7
9	2454	90	,,	=54, 55+5	12·4
9	2454	94	Ni	46−1	11·9
12	2457	,,	,,	46 (2) v (2) 54	12·1
17	2462	90	Bh	45−3, =49, 54+3	12·1
19	2464	94	Ni	46 (2) v (3) 54	12·0
22	2467	,,	,,	46 (1) v (4) 54	11·9
23	2468	90	Bh	40−2, =45	11·9
29	2474	,,	,,	=40, =45	11·8*b*
June					
4	2480	45	,,	19−10, =37	11·5*b*
8	2484	120	Br	32−2	11·3*b*
8	2484	90	Bh	19−5, 37+3	11·1
8	2484	94	Ni	32 (5) v (3) 46	11·5
15	2491	90	Bh	5−4, 7−2	9·8
18	2494	,,	,,	=7	9·6
20	2496	160	Br	5−3	9·7
23	2499	55	Bg	3−1, 6+3	9·2*b*
23	2499	90	Bh	=5, 6+1	9·4
29	2505	,,	,,	2−6, 5+10	8·4
July					
7	2513	45	Bh	2−3, 3+10	8·1
8	2514	30	Bg	2−3, 3+11	8·0*b*
8	2514	,,	D	2 (2) v (1) 3, 3+5	8·6*b*
8	2514	22	Ni	=d	8·3*b*
10	2516	45	Bh	2−1	7·8
13	2519	30	Bg	2−3, 3+11	8·0

Jan. 8, 24, About. Just glimpsed.
Jan. 15, 26; Feb. 16, About.
Feb. 18, About. Perhaps glimpsed.
Feb. 20, Invisible. Mar. 2, 10, Invisible.
Mar. 17, 12½-in. spec. Mar. 23, Not seen.
April 16, Br, Difficult.
May 4, Glimpsed. Difficult.

(787) W ANDROMEDÆ—*continued.*

1920					
July					
14	2520	30	D	2 (3) v (2) 3, 3+7	8·5*b*
15	2521	45	Bh	2+1	7·6
16	2522	22	Ni	2 (6) v (2) d	8·2
17	2523	45	Br	=2	7·7
18	2524	30	D	2 (3) v (2) 3	8·5*b*
19	2525	50	Bn	2+2	7·5
24	2530	45	Bh	2+2	7·5
27	2533	30	D	2 (1) v (4) 3, 2−4	8·0*b*
27	2533	22	Ni	2 (3) v (4) d	8·0
30	2536	45	Bh	2+2	7·5
31	2537	30	Bg	2+3	7·4
Aug					
1	2538	,,	D	2−3·5	8·1*b*
3	2540	45	Br	2+1	7·6
3	2540	22	Ni	2 (5) v (4) d	8·0
6	2543	45	Bh	2+2	7·5
6	2543	F	Gi	=2	7·7
6	2543	30	D	2−5	8·2*b*
10	2547	,,	,,	2 (1) v (5) 3, 2−4	8·0
13	2550	45	Bh	2+1	7·6
15	2552	30	Bg	2−2, 3+12	7·9
18	2555	45	Bh	2 1	7·8
19	2556	,,	Br	2−1	7·8
19	2556	30	Bn	2 (1) v (2) d	7·9*b*
19	2556	43	Gi	2−2·5	8·0
20	2557	45	Bh	2−4, 3+10	8·1*b*
22	2559	55	Bg	2−2, 3+12	7·9
28	2565	,,	,,	2−4, 3+10	8·1
29	2566	45	Bh	2−2	7·9*b*
Sept					
5	2573	43	Gi	2−3, 4+8	8·2
8	2576	30	D	2 (3) v (2) 3, 3+7	8·5
8	2576	22	Ni	d (1) v (6) 4	8·4
9	2577	30	Bn	2−4, d+1·5	8·1
10	2578	45	Bh	2−6, 3+8	8·3
12	2580	30	D	2 (3) v (1) 3, 3+4	8·7
12	2580	22	Ni	d (6) v (4) 4	8·8
13	2581	90	Bh	2−7, 3+7	8·4
15	2583	30	Tn	2 3	8·0
16	2584	45	Bh	2−10, 3+4	8·7
17	2585	30	D	2 (3) v (1) 3, 3+5	8·7*b*
18	2586	55	Bg	2−6, 3+8	8·3
19	2587	45	Br	2−5	8·2
19	2587	25	Bn	d−1	8·4
19	2587	22	Ni	d (6) v (3) 4	8·9
19	2587	30	Tn	2 (5) v (5) 3	8·4
21	2589	,,	,,	2 (8) v (2) 3, 3+3	8·8
22	2590	90	Bh	2−10, 3+4	8·7
24	2592	30	Tn	2 (8) v (2) 3	8·8
27	2595	55	Bg	2−9, 3+5	8·6
28	2596	90	Bh	3+3, 4+5	8·8*b*
30	2598	30	Tn	4+2	9·0*b*
Oct					
1	2599	22	Ni	d (7) v (1·5) 4	9·0
2	2600	45	Bh	5+7	8·7
3	2601	30	D	3+2	8·9*b*
5	2603	75	Gi	3+3·5	8·8
6	2604	55	Bg	2−12, 3+2	8·9
6	2604	45	Br	3+1, 4+1	9·1
6	2604	50	Bn	3+2	8·9*b*
7	2605	90	Bh	3+3, 4+3	8·9
8	2606	30	D	3+0·5	9·1
8	2606	22	Ni	d (9) v (1·5) 4	9·1
9	2607	90	Bh	3+2, 4+3	8·9
11	2609	30	D	=3, 5+3	9·1
12	2610	,,	Tn	=3	9·1

Sept. 19, Br, About.

1920					
Oct					
12	2610	90	Bh	=3, 4+1	9·1
18	2616	,,	,,	=3, =4	9·2
18	2616	94	Ni	4 (1) v (1) 3	9·2
19	2617	55	Bg	3+1	9·0
20	2618	45	Br	=4	9·2
20	2618	50	Bn	3+2	8·9
22	2620	90	Bh	4−1, 5+1	9·3
25	2623	150	Tn	=5	9·4
25	2623	50	Bn	3+1	9·0
26	2624	75	Gi	6+1·5	9·4
26	2624	150	Tn	=5	9·4
28	2626	94	Ni	3 (2) v (1) 6	9·4
29	2627	55	Bg	6−1, 11+3	9·6
29	2627	45	Bh	4−1, =5, 6+1	9·4
Nov					
1	2630	60	D	6−1	9·6
3	2632	94	Ni	6 (2) v (4) 19	9·8
4	2633	50	Bn	6 (2) v (1) 11	9·8
8	2637	90	Bh	6−4, 7−2	9·9
12	2641	55	Bg	=19	10·5
12	2641	79	Ma	5 (2) v (1) 19	10·1
13	2642	160	Br	=19	10·5
14	2643	117	Gi	=19	10·5
15	2644	90	Bh	7−2, =9	9·8
16	2645	79	Ma	18 (4) v (1) 21, 21+1	10·3
17	2646	94	Ni	19 (3) v (3) 32	10·8
18	2647	55	Bg	19−2, 27+2	10·7
20	2649	45	Bh	7−4, =9, =11, 14+3	9·9
21	2650	50	Bn	19 (2) v (1) 27	10·8
21	2650	150	Tn	=27	10·9
30	2659	90	Bh	=19, 27+5	10·5
Dec					
1	2660	55	Bg	27−2, =32, 37+3	11·1
1	2660	150	Tn	=32	11·1
2	2661	,,	,,	32 (5) v (5) 46	11·5
2	2661	94	Ni	32 (5) v (3) 46	11·5
3	2662	117	Gi	=31	11·1
4	2663	150	Tn	32 (5) v (5) 46	11·5
5	2664	,,	,,	32 (7) v (3) 46	11·6
6	2665	90	Bh	19−3, =27	10·6
8	2667	150	Tn	=46	11·8
8	2667	160	Br	=37	11·1
9	2668	50	Bn	32 (3) v (1) 37	11·5
10	2669	90	Bh	19−5, 32+1, 35+3	11·6
10	2669	79	Ma	46+1	11·1
17	2676	90	Bh	=37, 40+2	11·5
21	2680	,,	,,	37−2, =40, 44+2	11·6
22	2681	94	Ni	32 (5) v (1) 46	11·1
22	2681	150	Tn	=46	11·8
26	2685	75	Bg	49−2, 54+2	12·1
27	2686	150	Tn	46 (5) v (5) 54	12·1
28	2687	90	Bh	40−3, 44−1	12·0
30	2689	75	Bg	49−2, 54+2	12·1
31	2690	160	Br	=54	12·1
31	2690	150	Bh	46−2	12·0
1921					
Jan					
1	2691	,,	Tn	46 (5) v (5) 54	12·1
4	2694	,,	,,	54+1	12·1
4	2694	117	Gi	=53	12·1
6	2696	90	Bh	40−4, 46−2	12·1
7	2697	150	Tn	=54	12·1
9	2699	94	Ni	54−1	12·1
13	2703	120	Br	=54	12·1
13	2703	150	Bh	37−8, 40−6	12·1

Oct. 18, Ni, With 22, 9·3*b*.
Dec. 31, Br, About.

(787) W ANDROMEDÆ—*continued.*

1921					
Jan					
13	2703	150	Tn	54−1	12·5
16	2706	,,	,,	54 (5) v (5) 55	12·7*b*
16	2706	94	Ni	54 (4) v (1·5) 55	12·8
25	2715	117	Gi	53−6, 55+2	12·8*b*
26	2716	150	Tn	=55	12·9
31	2721	94	Ni	55−1	13·0
Feb					
10	2731	120	Bh	=55	12·9
11	2732	150	Tn	55−2	13·1
12	2733	94	Ni	55−2	13·1
13	2734	117	Gi	55−1·5	13·1*b*
17	2738	240	Br	<54	<12·4
18	2739	150	Bh	=55	12·9
24	2745	94	Ni	55−2	13·1*b*
25	2746	240	Br	55−5	13·4*b*
25	2746	117	Gi	55−3	13·2*b*
25	2746	150	Tn	55−7	13·6
26	2747	94	Ni	55 (6) v (1) B	13·4
Mar					
2	2751	180	Bg	<55	<12·9
2	2751	183	Ma	<55	<12·9
2	2751	150	Tn	<55	<12·9
7	2756	,,	Bh	55−2	13·1
11	2760	94	Ni	=B	13·5
14	2763	183	Ma	<55	<12·9
26	2775	,,	,,	<55	<12·9
26	2775	200	Bn	<54	<12·4
29	2778	94	Ni	B−1	13·6
30	2779	183	Ma	55−5	13·4*b*
31	2780	117	Gi	<55	<12·9*b*
Apr					
7	2787	60	Bh	=71, =74	14·0*b*
30	2810	94	Ni	55−2	13·1*b*
May					
7	2817	150	Bh	Estimated	<13·0
23	2833	90	,,	54−4, 55+1	12·8
30	2840	150	Wf	53−1, 55+2	12·6
31	2841	94	Ni	=54	12·4
31	2841	150	Bh	=54	12·4
June					
5	2846	90	,,	37−6, 54+3	12·1
6	2847	94	Ni	46 (2) v (1) 54	12·2
16	2857	117	Gi	37−2·5	11·7*b*
24	2865	94	Ni	32 (6) v (1·5) 46	11·7
26	2867	150	Wf	31−4, 52+1	11·8*b*
27	2868	120	Br	37−3	11·7*b*
30	2871	117	Gi	31−4, 37+1	11·4
July					
2	2873	90	Bh	=37	11·4*b*
2	2873	94	Ni	32 (6) v (3) 46	11·6
5	2876	75	Bg	=46	11·8*b*
7	2878	90	Bh	37+1	11·3
8	2879	94	Ni	32 (5) v (2) 46	11·6
9	2880	62	Wf	31−1, 37+2	11·2
9	2880	60	D	32−1, 37+3	11·2*b*

Feb. 17, Not seen.
Feb. 24, About.
Feb. 25, Br, About. Glimpsed.
Gi, also B+2=13·3.
Mar. 2, Ma, Not sure.
Mar. 14, Suspected.
Mar. 26, Ma, Bn, Not seen.
Mar. 31, Just glimpsed.
May 7, Not seen. 55 easy.
June 27, About.
July 9, Wf, 9-in.
July 9, D, Difficult.

1921					
July					
11	2882	117	Gi	19−5, 37+1·5	11·1*b*
16	2887	150	Wf	21−1, 31+2	10·8*b*
18	2889	90	Bh	27+1, 37+6	10·8
24	2895	62	Wf	5−3, 19+7	9·8*b*
25	2896	60	D	6−3, 11+2	9·8
26	2897	117	Gi	5−2, 6+1·5	9·5
29	2900	45	Bh	5−2, 6−1	9·0
31	2902	62	Wf	4−2, 6+1	9·4
31	2902	30	D	3−2, 5+1	9·3
31	2902	75	Bg	2−12, 3+2	8·0
Aug					
3	2905	60	D	3+4	8·7*b*
5	2907	75	Gi	2−16, d−2, 4+4	8·0
6	2908	30	D	2 (5) v (1) 3, 3+3	8·8*b*
6	2908	,,	Bg	2−6, 3+8	8·3
7	2909	45	Bh	2−10, 3+4	8·7
8	2910	62	Wf	2−4, 3+1	8·6
11	2913	30	D	2 (3) v (1) 3, 3+4	8·7*b*
16	2918	45	Bh	2−4, 3+10	8·1
17	2919	75	Gi	2−2·5, c−0·5 d+1, 4+15	7·9*b*
17	2919	22	Ni	2 (6) v (2·5) d	8·1
18	2920	30	Bg	2−2, 3+12	7·9
18	2920	,,	D	2 (3) v (1) 3, 3+4	8·7*b*
22	2924	45	Bh	=2	7·7
25	2927	,,	,,	2+2	7·5
25	2927	62	Wf	2−1, 3+4	8·3
25	2927	60	D	2 (1) v (3) 5, 2−4	8·1*b*
26	2928	22	Ni	2 (6) v (2) d	8·2
26	2928	30	D	2 (2) v (3) 3, 2−5	8·2
28	2930	,,	,,	2 (1) v (4) 3, 2−3	8·0
29	2931	45	Bh	2+1	7·6
30	2932	,,	,,	=2	7·7
30	2932	30	D	2 (1) v (3) 3, 2−3	8·0
31	2933	47	Gi	b−7, c+2	7·0
Sept					
2	2935	30	D	2 (1) v (5) 3, 2−2	7·9
2	2935	45	Bh	2−2	7·9
4	2937	,,	Br	=2	7·7
5	2938	30	Bn	d (1) v (4) 3	8·5
5	2938	,,	D	=2	7·7*b*
6	2939	22	Ni	2 (7·5) v (1·5) d	8·2
7	2940	30	Bg	2+1	7·6
7	2940	45	Bh	=2	7·7
9	2942	30	Bn	2 (3) v (1) d	8·2
10	2943	45	Bh	2+2	7·5
13	2946	47	Gi	=c	7·8*b*
14	2947	62	Wf	2−2, 3+3	8·4*b*
14	2947	30	D	2−3	8·0
15	2948	,,	Bn	2 (5) v (1) d	8·2
16	2949	45	Bh	2−2	7·9
18	2951	30	Tn	2 (3) v (7) 3	8·1
20	2953	,,	,,	2 (5) v (5) 3	8·4*b*
21	2954	,,	Bg	2−2, 3+12	7·9
21	2954	,,	Bn	d−1	8·4*b*
22	2955	22	Ni	2 (6) v (1) d	8·2
23	2956	30	D	2 (2) v (1) 3, 3+5	8·0
24	2957	45	Bh	2−4	8·1
25	2958	,,	,,	2−5	8·2
25	2958	30	Bg	2−3, 3+11	8·0
25	2958	45	Br	2−1	7·8
25	2958	30	Bn	d−1	8·4

July 16, 6-in.
July 24, 31, Wf, 3-in.
Aug. 8, 25, Wf, 3-in.
Aug. 18, D, Difficult.
Sept. 14, Wf, 3-in.

(787) W ANDROMEDÆ—*continued.*

1921 Sept					
27	2960	25	Bn	d−3	8·6
27	2960	30	D	2 (4) v (1) 3, 3+4	8·8
29	2962	,,	Bg	2−4, 3+10	8·1
30	2963	45	Bh	2−10, 3+6	8·6
30	2963	30	D	2 (3) v (1) 3, 3+4	8·7
30	2963	62	Wf	2−7, 5+3	8·8
Oct					
1	2964	30	Tn	3+3	8·8*b*
2	2965	47	Gi	=d	8·3
5	2968	55	Bg	2−11, 3+3	8·8
5	2968	90	Bh	3+6	8·5
6	2969	F	Wf	2−3, 3+7	8·2
6	2969	22	Ni	d (5) v (4) 4	8·8
9	2972	30	D	3+3	8·8
9	2972	45	Bh	3+5	8·6
15	2978	47	Gi	d−2·5, 4+4	8·7
16	2979	55	Bg	2−10, 3+4	8·7*b*
18	2981	22	Ni	d (3·5) v (1·5) 4	8·9
19	2982	30	Tn	2 (7) v (3) 3	8·7
21	2984	62	Wf	=4	9·2*b*
23	2986	30	Tn	2 (7) v (3) 3	8·7
23	2986	50	Bn	d (3) v (1) 3	8·9
24	2987	30	Bg	2−11, 3+3	8·8*b*
24	2987	45	Bh	3+1, 4+3	9·0
25	2988	,,	Br	2−5	8·2
Nov					
6	3000	55	Bg	3+1	9·0
6	3000	45	Br	4+4	8·8
6	3000	50	Bn	3+3	8·8
6	3000	30	Tn	=3	9·1
7	3001	,,	,,	>3, =4	9·0
7	3001	90	Bh	=3, =4	9·2*b*
9	3003	94	Ni	4 (3) v (0·5) 3	9·3
21	3015	47	Gi	3+1, 4−1	9·2
22	3016	94	Ni	3+2, =4, 6+4	9·1
22	3016	55	Bg	3−2, 6+2	9·3
23	3017	90	Bh	5+1, 6+2	9·3
27	3021	160	Br	5−3	9·7
27	3021	50	Bn	6 (1) v (3) 11	9·6
27	3021	94	Ni	=3	9·1
29	3023	55	Bg	5−1, =6	9·5*b*
Dec					
3	3027	150	Tn	5−2	9·6
3	3027	90	Bh	5−1, =6	9·5
7	3031	55	Bg	6−1, 11+3	9·6*b*
10	3034	117	Gi	6−2·5, 19+3·5	10·0*b*
13	3037	45	Bh	7−2, 11+1	9·8
15	3039	62	Wf	5−3, 19+2	10·0
17	3041	55	Bg	=19	10·5
23	3047	94	Ni	19 (1·5) v (3·5) 32	10·7
23	3047	160	Br	=27	10·9
25	3049	90	Bh	7−6, 19+3	10·2
28	3052	94	Ni	19 (4) v (3) 32	10·8
29	3053	55	Bg	19−3, 27+1	10·8
30	3054	90	Bh	=19	10·5*b*
30	3054	117	Gi	18−2, 31+2·5	10·7*b*
30	3054	62	Wf	19−1, 21+2	10·5
31	3055	75	Bn	32+1	11·0
1922 Jan					
1	3056	90	Bh	17−3, 27+3	10·7
3	3058	160	Br	=27	10·9
8	3063	90	Bh	23−5, 27−2	11·1
10	3065	62	Wf	32−1, 38+2	11·2
1922 Jan					
13	3068	117	Gi	18 (5·5) v (2·5) 31	10·9
16	3071	55	Bg	27−3, 37+2	11·2
17	3072	62	Wf	31 (1) v (1) 37	11·3
18	3073	90	Bh	27−5, =37	11·4
21	3076	120	Br	=37	11·4
23	3078	62	Wf	34−2, =37, 40+3	11·4
28	3083	183	Ma	=37	11·4
29	3084	90	Bh	=40, =44, =45	11·8
Feb					
1	3087	75	Bg	46−2, =49	12·0
4	3090	117	Gi	31 (8) v (2) 52	11·9
4	3090	150	Wf	49−1, 52+0·5	12·1
4	3090	94	Ni	46 (2) v (1) 54	12·2
5	3091	90	Bh	=49	12·0
17	3103	,,	,,	45−5, 46−4	12·3
18	3104	75	Bg	54−2, 55+3	12·6
18	3104	120	Br	54+1	12·3
18	3104	150	Bn	54 (4) v (1) 55	12·8
19	3105	,,	Wf	54−2, 55+3	12·6
25	3111	94	Ni	54 (4) v (4) 55	12·7
26	3112	117	Gi	53 (4·5) v (2) 55	12·7
28	3114	150	Wf	54−4, 55+1	12·8
Mar					
4	3118	120	Br	54−2, 55+2	12·7
14	3128	90	Bh	54−3, 55+1	12·8
15	3129	150	Wf	55−2	13·1
17	3131	90	Bh	54−5, 55−1	13·0
18	3132	94	Ni	55−3	13·2
22	3136	231	Wf	55−3	13·2
22	3136	90	Bh	54−5, 55−3	13·1
31	3145	150	,,	55−3	13·2
Apr					
5	3150	231	Wf	55−3	13·2
9	3154	150	Bh	55−3	13·2
14	3159	117	Gi	<(53−3)	<12·6
19	3164	150	Bh	55−5	13·4
20	3165	157	Wf	...	<12·9
29	3174	90	Bh	<55	<12·9
May					
21	3196	94	Ni	...	<13·6
27	3202	60	Bh	55−10	13·9
29	3204	94	Ni	54 (4) v (1) 55	12·8
29	3204	150	Wf	=55	12·9
June					
1	3207	94	Ni	54 (3) v (1·5) 55	12·7
17	3223	157	Wf	54−2	12·6
24	3230	,,	,,	49−5, =54	12·5
July					
4	3240	80	Ca	...	<12·1
5	3241	117	Gi	=37	11·4
10	3246	90	Bh	52+1, 54+3	12·1
12	3248	94	Ni	=46	11·8
18	3254	160	Br	37+3	11·1
19	3255	117	Gi	=31	11·1
20	3256	90	Bh	27−3, =34	11·2
23	3259	150	Wf	27−3, 37+4	11·1
27	3263	90	Bh	=34, =36	11·3
30	3266	120	Bn	32−1	11·2
31	3267	55	Bg	27−1, 37+4	11·0
31	3267	117	Gi	21 (1) v (4) 31	10·6
Aug					
5	3272	90	Bh	29−2, 37+2	11·2
7	3274	94	Ni	19 (5) v (2·5) 32	10·9

Sept. 30, Wf, 3-in.
Nov. 7, Tn, Say 9·0. 4=3+3.
Nov. 22, Ni With 22, 9·5.

Mar. 4, Difficult.
April 20, Possibly about 13·1.
April 29, May 21, Not seen.
July 4, Invisible.

(787) W ANDROMEDÆ—*continued.*

1922 Aug					
11	3278	117	Gi	19−1	10·6
12	3279	90	Bh	23−3, =29	11·0
16	3283	55	Bg	19−1, 27+3	10·6
16	3283	94	Ni	=19	10·5
16	3283	150	Wf	11−2, 19+3	10·2
17	3284	90	Bh	18−3, 19−1	10·7
20	3287	,,	,,	7−5, 11−2, 18+3	10·1
20	3287	160	Br	5−2, 6−2	9·7
20	3287	55	Bg	11−2, 19+4	10·1
23	3290	,,	,,	6−2, 11+2	9·7
23	3290	62	Wf	5−2, =7	9·6
24	3291	117	Gi	=6	9·5
25	3292	90	Bh	=5, =6	9·5
26	3293	55	Bg	5−1, =6	9·5
26	3293	80	Ca	4 (1) v (1) 5	9·3
27	3294	94	Ni	=4	9·2
29	3296	45	Bh	=4, =5	9·3
31	3298	90	,,	=3, 4+1, 5+3	9·1
31	3298	55	Bg	3+1	9·0
Sept					
4	3302	45	Bh	2−10, 3+4	8·7
7	3305	,,	,,	2−7, 3+7	8·4
7	3305	32	Ca	2 (8) v (6) 3	8·5
10	3308	45	Bh	=2	7·7
10	3308	94	Ni	2 (7) v (0·5) d	8·3
13	3311	32	Ca	2 (7) v (6) 3	8·4
13	3311	F	Wf	2−3	8·0
15	3313	45	Bh	2+4	7·3
17	3315	,,	Br	2+2	7·5
18	3316	,,	Bh	2+2	7·5
18	3316	94	Ni	2 (4) v (4) d	8·0
19	3317	47	Gi	b (3·5) v (3) c	7·4
20	3318	F	Bg	1 (3) v (1) 2	7·1
21	3319	45	Bh	2+4	7·3
23	3321	62	Wf	2+2	7·5*b*
24	3322	F	Bg	1−20, 2+6	7·1*b*
24	3322	50	Bn	b (3) v (2) 2	7·4
26	3324	45	Bh	2+3	7·4
29	3327	F	Bg	1−19, 2+7	7·0*b*
29	3327	32	Ca	1 (17) v (9) 2	6·8*b*
Oct					
1	3329	45	Br	=b, 2+5	7·1
2	3330	,,	Bh	2+2	7·5
7	3335	22	Ni	b (5) v (2) 2	7·5
8	3336	32	Ca	1 (16) v (10) 2	6·7
11	3339	F	Wf	2+2	7·5
11	3339	,,	Bg	1−19, 2+7	7·0
11	3339	45	Bh	2+4	7·3
13	3341	,,	,,	2+1	7·6
14	3342	25	Bn	b (4) v (1) 2	7·6
16	3344	55	Bg	2+3	7·4
17	3345	62	Wf	2+3	7·4*b*
17	3345	75	Gi	b (3·5) v (4) c	7·4
18	3346	45	Bh	=2	7·7
19	3347	32	Ca	1 (23) v (3) 2	7·4
21	3349	22	Ni	2 (2) v (4) d	7·9
21	3349	45	Br	2+3	7·4
22	3350	30	Bn	2 (1) v (1) d	8·0
25	3353	55	Bg	2−3, 3+11	8·0
25	3353	45	Bh	2−4, 3+10	8·1
28	3356	32	Ca	1 (25) v (1) 2	7·6
30	3358	25	Bn	2 (3) v (2) d	8·1
Nov					
1	3360	55	Bg	2−9, 3+5	8·6
1	3360	45	Bh	2−7, 3+7	8·4
8	3367	32	Ca	c (4) v (1) d	8·2
9	3368	22	Ni	d (4) v (5) 4	8·7
9	3368	30	Bg	2−8, 3+6	8·5*b*
11	3370	90	Bh	3+6, 4+8, 5+10	8·4
1922 Nov					
11	3370	45	Br	2−2	7·9
16	3375	32	Ca	d (1) v (6) f	8·4
17	3376	75	Gi	c (1·5) v (1) d	8·1
18	3377	22	Ni	d (6) v (2·5) 4	8·9
19	3378	90	Bh	3+6, 5+9, 6+10	8·5
24	3383	,,	,,	3+5, 4+6, 6+8	8·6
24	3383	30	Bg	2−11, 3+3	8·8
24	3383	45	Br	3+3	8·8
24	3383	32	Ca	d (2) v (5) f	8·5
28	3387	90	Bh	3+5	8·6*b*
30	3389	47	Gi	d (4·5) v (4·5) 4	8·8
Dec					
1	3390	90	Bh	3+5	8·6
6	3395	45	,,	2−10, 3+4	8·7
6	3395	30	Bg	2−11, 3+3	8·8*b*
7	3396	32	Ca	4 (1) v (1) 5	9·3
8	3397	22	Ni	3+1, 4+1·5	9·0
11	3400	90	Bh	2−10, 3+3, 4+5	8·7
14	3403	94	Ni	4+1·5	9·1
15	3404	55	Bg	3+1	9·0*b*
17	3406	90	Bh	3+1, 4+2	9·0
19	3408	45	Br	3+1	9·0
20	3409	75	Bn	3+2	8·9
22	3411	30	Bg	3−2, 11+6	9·3
25	3414	90	Bh	=3, =4	9·2
28	3417	,,	,,	3−1, =4, 5+1	9·2
1923 Jan					
4	3424	55	Bg	5−1, =6	9·5*b*
4	3424	90	Bh	=4, =5, 6+1	9·3
6	3426	,,	,,	=5, =6	9·5
6	3426	94	Ni	=6	9·5
11	3431	90	Bh	5−2, 6−1, =7	9·6
14	3434	,,	,,	7−2	9·8
14	3434	94	Ni	6 (3) v (1) 19	10·3
14	3434	32	Ca	=19	10·5
14	3434	44	Li	6 (5) v (5) 7	9·6
14	3434	160	Br	6−5, 19+5	10·0
15	3435	75	Bg	11−3, 19+3	10·2
18	3438	117	Gi	6 (2·5) v (3·5) 19	9·9
20	3440	79	Ma	5−6, 6−1	9·8
23	3443	62	Wf	7−2, 11+1	9·8
25	3445	50	Bn	6 (2) v (1) 11	9·8
25	3445	55	Bg	19−1, 27+3	10·6
27	3447	90	Bh	17−2	10·6
Feb					
3	3454	,,	,,	17−4	10·8
4	3455	50	Bn	19 (1) v (2) 27	10·6
5	3456	160	Br	27−2	11·1
6	3457	94	Ni	19 (4·5) v (2·5) 32	10·9
7	3458	62	Wf	19−4, 32+3	10·9
8	3459	90	Bh	=27	10·9
9	3460	80	Ca	=30	11·0
13	3464	94	Ni	19 (5) v (0·5) 32	11·0
16	3467	90	Bh	=37	11·4
25	3476	,,	,,	37−5, =46	11·9
26	3477	94	Ni	32 (5) v (1) 46	11·7
Mar					
2	3481	90	Bh	46−2, =49	12·0*b*
3	3482	75	Bg	37−2, 46+2	11·6*b*
5	3484	32	Ca	<40	<11·7
13	3492	117	Gi	=52	12·1
17	3496	94	Ni	=54	12·4
17	3496	90	Bh	46−4, 49−1	12·2*b*

Dec. 14, With 22, 9·4.
Jan. 18, 5c.
Mar. 5, Invisible.

(787) W ANDROMEDÆ—*continued.*

1923					
Mar					
25	3504	94	Ni	54 (2) v (4) 55	12·6
27	3506	90	Bh	=54	12·4
Apr					
1	3511	,,	,,	=54	12·4
4	3514	94	Ni	54 (3) v (3) 55	12·7
8	3518	157	Wf	53−4, 55+0·5	12·8
8	3518	193	Li	<55	<12·9
9	3519	90	Bh	54−2, 55+3	12·6
15	3525	157	Wf	54−4, 55+2	12·8
17	3527	90	Bh	54−5, =55	12·9
22	3532	150	,,	=55	12·9
May					
3	3543	,,	,,	55−2	13·1
21	3561	,,	,,	55−3	13·2
July					
5	3606	94	Ni	<54	<12·4
8	3609	157	Wf	54−1, 55+4	12·5
8	3609	120	Bn	=54	12·4
10	3611	94	Ni	54 (3) v (3) 55	12·7
11	3612	117	Gi	37 (4) v (2) 55	12·4*b*
12	3613	94	Ni	54 (2) v (3) 55	12·6
19	3620	157	Wf	46−7, 54+1, 55+6	12·4
20	3621	150	Bh	46−3, 49−2	12·2
21	3622	94	Ni	46 (3) v (2) 54	12·2
30	3631	150	Bh	37−3, 46+1	11·7
Aug					
1	3633	90	,,	37−1	11·5*b*
1	3633	94	Ni	32 (7) v (1) 46	11·7
2	3634	75	Bg	=49	12·0
3	3635	90	Bh	32−2, 37+1	11·3
4	3636	150	,,	32−3, 46+5	11·4
5	3637	ÖG	Ph	37−3, 40+2	11·6
5	3637	157	Wf	=37	11·4
6	3638	120	Ga	=37, =46	11·6
8	3640	75	Bg	37 (1) v (2) 46	11·5
8	3640	120	Bn	37 (1) v (1) 40	11·6
9	3641	160	Br	37−2	11·6
9	3641	90	Bh	32−1, 37+2	11·2
12	3644	157	Wf	=49, 54+4	12·0
15	3647	120	Bn	37 (2) v (3) 40	11·5
15	2647	90	Bh	=32, 37+3	11·1
18	3650	,,	,,	=29	11·0
22	3654	,,	,,	=27, =31, 32+1	11·0
22	3654	75	Bg	=37	11·4*b*
26	3658	90	Bh	=32	11·1
31	3663	,,	,,	=27, =29, =32	11·0*b*
Sept					
2	3665	90	Bh	=31	11·1
2	3665	94	Ni	32 (4) v (2) 46	11·6
3	3666	150	Wf	=33, 37+2	11·2
5	3668	80	Ca	34 (1) v (1) 37	11·3
7	3670	45	Br	=33	11·2
7	3670	60	Ga	32−3, 37+3	11·3
7	3670	90	Bh	=29, =31	11·1
8	3671	94	Ni	32 (4) v (4) 46	11·5
8	3671	150	Wf	32−3, 37+1	11·4
8	3671	120	Bn	32 (3) v (1) 37	11·3
8	3671	75	Bg	27 (1) v (4) 37	11·0
10	3673	90	Bh	=27	10·9
11	3674	60	D	27−4, 33+1	11·2
13	3676	90	Bh	19−3, 27+1, 29+2	10·8
14	3677	150	Wf	27−2, =32	11·1*b*
15	3678	90	Bh	19−1, 21−2	10·7
17	3680	55	Bg	19 (1) v (3) 27	10·6

April 8, Li, Glimpsed.
Aug. 6, T.
Sept. 7, Oct. 9, Ga T.

1923					
Sept					
18	3681	60	D	20−4, 27+1	10·9
18	3681	94	Ni	19 (4·5) v (1·5) 32	11·0
22	3685	90	Bh	=19, 21+1	10·5
29	3692	160	Br	=5, =6	9·5
30	3693	55	Bg	6 (1) v (3) 11	9·6
30	3693	150	Wf	5−3, 11+3	9·7
30	3693	32	Ca	=5	9·4
30	3693	90	Bh	5−1, =6, 7+1	9·5
Oct					
2	3695	,,	,,	=3, 4+1, 5+3	9·1
4	3697	45	,,	=4, 5+1, 6+2	9·3
8	3701	32	Ca	=4	9·2
9	3702	60	Ga	3+5	8·6
9	3702	62	Wf	3+3, 6+6	8·9
9	3702	45	Bh	3+2, 6+5	9·0
11	3704	,,	,,	2−6, 3+8	8·3
11	3704	,,	Br	2−4	8·1
13	3706	22	Ni	d (1·5) v (6) 4	8·5
14	3707	30	Bg	2 (1) v (2) d	7·9
15	3708	32	Ca	2 (3) v (3) d	8·0
17	3710	30	D	b−5, 2+2	7·5
17	3710	45	Bh	2+1	7·6
19	3712	,,	,,	2+3	7·4
21	3714	,,	,,	2+3	7·4
21	3714	32	Ca	b (2) v (5) 2	7·2
22	3715	30	Bg	b (1) v (2) 2	7·2
23	3716	50	Bn	b (3) v (2) 2	7·4
25	3718	22	Ni	b+1	6·9
25	3718	45	Bh	2+5	7·2
26	3719	32	Ca	2 (6) v (4) 6	6·6
26	3719	30	Bg	b (1) v (6) 2	7·1
27	3720	60	Ga	2+2	7·5
29	3722	45	Bh	2+7	7·0
29	3722	30	D	a (5) v (1) b, b+2	6·8
30	3723	F	Wf	1 (7) v (3) 2, 2+6	7·0
Nov					
1	3725	45	Bh	2+7	7·0
3	3727	,,	,,	1 (2) v (1) 2	6·8
3	3727	B	Ca	a (1) v (9) b	6·1
4	3728	30	D	a (2) v (1) b, b+3	6·6
4	3728	45	Br	b+5, 2+10	6·6
4	3728	F	Bg	b (1) v (7) 2	7·0
7	3731	50	Bn	b+2	6·8
7	3731	B	Ca	=a	6·0
7	3731	30	D	a (2) v (3) b, b+5	6·4
7	3731	45	Bh	2+6	7·1
8	3732	F	Bg	=b	7·0
10	3734	22	Ni	a (2) v (2) b	6·5
10	3734	30	D	a (4) v (1) b, b+3	6·7
10	3734	45	Bh	2+6	7·1
11	3735	B	Ca	=a	6·0
14	3738	,,	,,	=a	6·0
15	3739	F	Bg	a (9) v (1) b	6·9
17	3741	50	Bn	b (1) v (3) 2	7·1
17	3741	45	Bh	1−10, 2+7	6·6
20	3744	,,	,,	1−10, 2+7	6·6
23	3747	,,	,,	1−10, 2+6	6·6
24	3748	B	Ca	b (1) v (7) 2	7·0
30	3754	30	D	b−6, 2+1	7·6
30	3754	55	Bg	b (5) v (1) 2	7·6

Oct. 25, Ni, 4^c.
Oct. 27, T.
Oct. 29, D, 5^c.
Nov. 4, D, 3^c, Br, Orange.
Nov. 7, D, 3^c.
Nov. 10, Ni, 3^c·5, D, 4^c.

(787) W ANDROMEDÆ—*continued.*

1923 Dec					
2	3756	B	Ca	b (4) v (4) c	7·4
2	3756	45	Bh	2+4	7·3
2	3756	50	Bn	b (2) v (1) 2	7·5
3	3757	30	Bg	b (7) v (1) 2	7·6*b*
3	3757	45	Br	2+2	7·5
4	3758	,,	Bh	2+3	7·4
5	3759	B	Ca	=2	7·7
8	3762	45	Bh	2−2	7·9
8	3762	30	Bg	2 (1) v (3) d	7·9*b*
9	3763	22	Ni	d (1·5) v (5) 4	8·5
9	3763	30	D	2−3, d+4	8·0
10	3764	B	Ca	c (1) v (4) d	7·9
12	3766	45	Bh	2−3	8·0
15	3769	30	Bg	d (1) v (6) 3	8·4
18	3772	32	Ca	c (4) v (1) d	8·2
18	3772	50	Bn	2 (7) v (5) d	8·1
18	3772	45	Bh	2−4	8·1
22	3776	,,	,,	2−6	8·3
23	3777	50	Bn	d (1) v (7) 3	8·4
23	3777	55	Bg	d (3) v (1) 3	8·9
24	3778	30	D	d (3) v (1) 3, 3+2	8·9*b*
24	3778	45	Bh	2−6, 3+8	8·3
28	3782	,,	,,	2−10, 3+4	8·7
28	3782	55	Bg	d (5) v (1) 3	9·0*b*
30	3784	32	Ca	3+1	9·0
30	3784	60	D	3+1	9·0
30	3784	22	Ni	=4	9·2
1924 Jan					
3	3788	45	Br	3+2	8·9
3	3788	90	Bh	3+1, 4+1	9·1
5	3790	55	Bg	d (8) v (1) 3	9·0
5	3790	40	D	3+1	9·0
6	3791	50	Bn	3+2	8·9
6	3791	32	Ca	4 (1) v (1) 5	9·3
7	3792	90	Bh	3−1, =4	9·2
7	3792	94	Ni	=3	9·1
12	3797	40	D	3−3, 5+1	9·4
15	3800	,,	,,	3−2, 5+1	9·3
15	3800	55	Bg	3 (2) v (1) 5	9·3
15	3800	94	Ni	3 (3) v (3) 6	9·3
16	3801	90	Bh	4−2, =5, 6+1	9·4
23	3808	40	D	=6	9·5
25	3810	50	Bn	4 (4) v (1) 6	9·4
25	3810	120	Br	=5, =6	9·5
25	3810	90	Bh	=5, =6	9·5
27	3812	94	Ni	=6	9·5
27	3812	55	Bg	5 (3) v (1) 11	9·8
28	3813	40	D	6 (2) v (3) 19, 6−5	9·9
29	3814	80	Ca	=19	10·5
31	3816	40	D	6 (3) v (1) 19, 19+2	10·3
31	3816	90	Bh	4−5, 5−3, 6−1	9·7
Feb					
1	3817	50	Bn	6 (1) v (2) 11	9·6
1	3817	62	Wf	5−2, =7	9·6
8	3824	,,	,,	11−4, =19	10·4
8	3824	32	Ca	22 (2) v (1) 27	10·8
11	3827	45	Bh	19+1	10·4*b*
13	3829	40	D	19−3	10·8*b*
14	3830	94	Ni	19 (4) v (4) 32	10·8
16	3832	50	Bn	11−4, 21+2	10·3
18	3834	90	Bh	19−1	10·6
21	3837	,,	,,	=27, 29+2	10·9
22	3838	94	Ni	32 (2) v (4) 46	11·3
1924 Feb					
23	3839	80	D	27−2, 33+2	11·1
23	3839	,,	Ca	32 (1) v (2) 38, =33	11·2
24	3840	90	Bh	=29	11·0
28	3844	160	Br	37+1	11·3
Mar					
1	3846	94	Ni	32 (5) v (2) 46	11·6
1	3846	90	Bh	32−3, =37	11·4
4	3849	,,	,,	=45, 49+1	11·9*b*
4	3849	80	D	27−4, 37+2	11·3
4	3849	50	Bn	32 (2) v (1) 37	11·3
5	3850	75	Bg	27 (1) v (2) 37	11·1
5	3850	80	Ca	37−1, =39	11·5
8	3853	94	Ni	32 (7) v (1) 46	11·7
8	3853	40	D	37+2	11·2
9	3854	120	,,	27−4, 37+2	11·3
9	3854	,,	Bn	37 (4) v (1) 40	11·6
9	3854	45	Bh	37−3, =45	11·8*b*
11	3856	80	D	=37	11·4
22	3867	90	Bh	40 (2) v (1) 54	12·2
26	3871	,,	,,	=54	12·4*b*
29	3874	,,	,,	=54	12·4
30	3875	94	Ni	=54	12·4
30	3875	120	Bn	49 (1) v (2) 54	12·1
Apr					
4	3880	90	Bh	54−2, 55+2	12·7
7	3883	150	Bn	49 (2) v (1) 54	12·3
7	3883	,,	Wf	=54	12·4
11	3887	90	Bh	=55	12·9*b*
20	3896	150	,,	=55	12·9
24	3900	157	Wf	<54	<12·4*b*
27	3903	94	Ni	=54	12·4*b*
29	3905	231	Wf	54−2	12·6*b*
May					
3	3909	150	Bh	<55	<12·9
5	3911	231	Wf	<54	<12·4*b*
7	3913	94	Ni	54 (3) v (2) 55	12·7
31	3937	120	Bh	59 (1) v (1) 67	13·5
June					
2	3939	157	Wf	<54	<12·4*b*
7	3944	231	,,	55−3	13·2
23	3960	,,	,,	55−3	13·2
23	3960	M	Ph	55−3	13·2*b*
28	3965	231	Wf	55−6	13·5
July					
2	3969	94	Ni	<55	<12·9
3	3970	231	Wf	55−4	13·3*b*
8	3975	,,	,,	55−5	13·4
10	3977	M	Ph	55−5	13·4*b*
11	3978	150	Bh	<55	<12·9
11	3978	94	Ni	<55	<12·9
22	3989	157	Wf	55−4	13·3
23	3990	150	Bh	<55	<12·9
26	3993	94	Ni	55−2, 59−2, 66+2	13·3
27	3994	157	Wf	55−2	13·1
Aug					
1	3999	90	Bh	55−5	13·4
4	4002	157	Wf	55−0·5	13·0
7	4005	150	Bh	54−8, 55−4, =59	13·2
19	4017	90	,,	=55	12·9
19	4017	120	Br	55−5	13·4*b*

Dec. 30, D, 4c.
Feb. 13, Difficult.

April 24, Suspected.
May 3, Not seen.
July 2, Not seen.
July 11, Bh, Ni, Not seen.
July 23, Bh, Not seen.
Aug. 19, Br, About. Glimpsed.

(787) W ANDROMEDÆ—*continued.*

1924 Aug					
22	4020	157	Wl	54−2, 55+4	12·6
26	4024	120	Bh	54−3, 55+2	12·7
27	4025	,,	D	54+1	12·3
27	4025	75	Bg	49 (1) v (2) 54	12·1
31	4029	157	Wl	37 (4) v (1) 49	11·6
Sept					
2	4031	90	Bh	37−5	11·9
5	4034	,,	,,	37−3, 46+1	11·7
7	4036	157	Wl	37−2, 40+1	11·6
14	4043	94	Nl	34 (5) v (1) 46	11·7
14	4043	90	Bh	27−8, =31	11·3*b*
16	4045	,,	,,	=27, =31	11·0
22	4051	75	Bg	27 (3) v (1) 37	11·3
22	4051	60	D	29−2, 37+2	11·2
24	4053	90	Bh	=31	11·1
26	4055	,,	,,	19 (2) v (1) 31	10·9
27	4056	160	Bk	27−2, 37+2	11·4
27	4056	34	Ca	=34	11·2
27	4056	64	Wl	32 (1) v (1) 37	11·3
28	4057	75	Bg	27 (1) v (3) 37	11·0*b*
30	4059	45	Bh	10−1	10·6*b*
Oct					
3	4064	32	Ca	=34	11·2
5	4064	90	Bh	10+1	10·4
5	4064	64	Wl	20−3, 27+1	10·8
8	4067	75	Bg	19 (3) v (1) 27	10·8
9	4068	32	Ca	<20	<10·5
11	4070	90	Bh	10+2	10·3
16	4075	32	Ca	=27	10·9
17	4076	90	Bh	7 (1) v (3) 19	9·8
20	4079	32	Ca	=23	10·6
20	4079	68	Ha	11 (2) v (3) 19	10·1
23	4082	94	Nl	=19	10·5
23	4082	90	Bh	5+1, 6+2	9·3
23	4082	120	Bk	5−3, 6 2	9·7
23	4082	75	Bg	5 (1) v (3) 11	9·5
24	4083	32	Ca	=11	9·9
25	4084	45	Bh	4−1, 5+1	9·3
26	4085	157	Wl	5 −2, 6 −1	9·6
30	4089	32	Ca	4 (1) v (1) 5	9·3
30	4089	55	Bg	3 (3) v (1) 5	9·3
31	4090	45	Bh	=3, 5+3	9·1
Nov					
3	4093	30	Bn	3	3	8·8
1	4093	45	Bk	3	5	8·6
1	4093	60	D	3+1	9·0
3	4093	34	Li	2 (7) v (3) 3	8·7*b*
4	4094	22	Nl	d (6) v (3) 4	8·9
1	4094	45	Bh	1−10 3+3	8·8
1	4094	68	Ha	4+1	9·1
6	4096	34	Li	2 (3) v (7) 3	8·1*b*
8	4098	45	Bh	2 (1) v (1) 3	8·4

Oct. 9, Invisible in moonlight.
Nov. 3, Bk, About.

1924 Nov					
10	4100	32	Ca	2−1, =c	7·5
12	4102	,,	,,	b (5) v (2) 2	7·3
14	4104	46	D	b (2) v (1) d	7·6
15	4105	22	Nl	2 (3) v (4) d	8·0
15	4105	45	Bh	2+2	7·5
17	4107	30	Bg	b (3) v (2) 2	7·4
17	4107	,,	D	b−5, d+2	7·8
19	4109	45	Bh	2+5	7·7
20	4110	32	Ca	—b	7·9
22	4112	B	,,	b (3) v (4) 2	7·7
23	4113	,,	,,	b (2) v (5) 2	7·5
24	4114	45	Bh	2	3	7·4
25	4115	22	Nl	b (5) v (2) 2	7·5
27	4117	30	Bg	b (1) v (2) 2	7·7
27	4117	45	Bh	2	4	7·3
29	4119	,,	,,	2	3	7·4
29	4119	F	Wl	2	5	7·7
29	4119	B	Ca	b (2) v (5) 2	7·4
30	4120	,,	,,	b (1) v (6) 2	7·1
30	4120	25	Bn	2	3	7·3
30	4120	30	D	b 2, d	5	7·3
30	4120	t	Bk	2	3	7·4
Dec					
1	4121	B	Ca	b (1) v (7) 2	7·0
2	4122	t	Bk	2+4	7·3
2	4122	45	Bh	3+4	7·3
3	4123	34	Li	1 (9) v (1) 2	7·4
4	4124	B	Ca	b (1) v (7) 2	7·0
5	4125	30	Bg	b (3) v (1) 2	7·5
5	4125	25	Bn	b−3, 2+5	7·4
12	4132	B	Ca	b (1) v (7) 2	7·0
12	4132	45	Bh	2+4	7·3
14	4134	,,	,,	2	2	7·3
14	4134	25	Bn	b	1	6·9
14	4134	t	Bk	2	3	7·4
14	4134	30	Bg	b (1) v (2) 2	7·4
17	4137	F	Ha	1 (2) v (1) 2	6·8
17	4137	B	Ca	b (2) v (5) 2	7·2
20	4140	45	Bh	2	2	7·3
22	4142	t	Bk	2	2	7·3
22	4142	30	Bg	—2	7·7
22	4142	B	Ca	b (3) v (4) 2	7·3
22	4142	22	Nl	2 (2) v (6) d	7·9
24	4144	45	Bh	2	4	7·3
25	4145	30	D	b 3, d	2	7·8
26	4146	,,	Bg	b (6) v (1) 2	7·0
26	4146	25	Bn	b+2	6·8
28	4148	F	Ha	1 (2) v (1) 2, 2+10	6·8
30	4150	45	Bh	2+4	7·3
31	4151	M	Ph	2+2	7·3
31	4151	30	Bg	2 (1) v (1) d	8·0

Nov. 20, With B, 7·3.
Dec. 22, Bk 5°.

(6849) R AQUILÆ. (V. 1.)

H.D. 190108.

Star A = B.D. + 8° 3956, 7m·26, estimated by Gore.
„ D = „ + 7° 3987, 7·39, **H.A., 54,** 211.
„ F = „ + 6° 4014, 6·88, „ **54,** 209.
„ H = Fl. 62 Serpentis, 5·65, „ **44,** 79.
„ M = B.D. + 8° 3951, 6·62, „ **50,** 162.
„ N = „ + 7° 3988, 7·78, estimated by Nijland.
„ O = „ + 6° 4021, 6·72, **H.A., 54,** 210.

Date.	Julian Date.	Inst.	Observer.	Comparisons.	Deduced Mag.
1920 Jan					
1	2325	45	Bh	1−4	6·5
5	2329	„	„	1−4, 2+6	6·5
8	2332	„	„	1−5, 2+5	6·6
15	2339	„	„	1−5, 2+5	6·6
22	2346	„	„	2+3	6·9
23	2347	22	Ni	D (6) v (2) N	7·7
24	2348	45	Bh	2+2	7·0
26	2350	„	„	2−2, 3+5	7·4*b*
26	2350	30	Bn	2 (2) v (1) A	7·2
31	2355	„	„	2 (3) v (1) 3	7·7
Feb					
5	2360	45	Bh	2−4, 3+4, 4+4	7·5
6	2361	22	Ni	N (6·5) v (2) 5	8·2
8	2363	45	Bh	3+3, 5+6	7·6
12	2367	„	„	3−2, 5+3	8·0
15	2370	90	„	3−1, 5+3	8·0
18	2373	30	Bn	4 (1) v (2) 6	8·1*b*
23	2378	45	Bh	=3, =4	7·9
27	2382	22	Ni	=5, 5+1	8·3*b*
28	2383	23	Bo	6 (1) v (3) 7	8·6
29	2384	45	Bh	=3, =4	7·9
Mar					
4	2388	23	Bo	4 (3) v (1) 5	8·2*b*
6	2390	50	Bn	4 (2) v (1) 6	8·3
6	2390	45	Bh	3−3, 4−2, 5+2, 6+4	8·1
12	2396	90	„	6−2, =7, 8+1	8·8*b*
12	2396	23	Bo	6 (1) v (1) 7	8·7
15	2399	22	Ni	13−2	9·7
18	2402	90	Bh	=7, =8	8·9
19	2403	55	Bo	7 (3) v (1) 8	8·9
19	2403	50	Bn	8 (3) v (1) 11	9·2
22	2406	94	Ni	13−0·5	9·5
23	2407	30	Bn	=11	9·3
25	2409	50	„	12 (3) v (2) 15	9·9
25	2409	23	Bo	=14	10·0
25	2409	90	Bh	8−2, 11+2, 13+4	9·1
30	2414	23	Bo	=12	9·5*b*
31	2415	90	Bh	7−3, 8−3	9·2
Apr					
6	2421	55	Bo	=14	10·0
11	2426	45	Bh	=11, 12+1	9·3
13	2428	75	Bn	15−1	10·2
16	2431	94	Ni	13 (5) v (4) 23	10·4
1920 Apr					
17	2432	90	Bh	12−3, =15, 21+10	9·9*b*
27	2442	„	„	15−2, 21+7	10·3
May					
4	2449	94	Ni	13 (6) v (3) 23	10·6
7	2452	120	Bn	21−3, 23+1	11·1
9	2454	90	Bh	=21, 23+3	10·9
9	2454	60	D	23−2, 25+1	11·3
12	2457	94	Ni	13 (8) v (1·5) 23	10·9
13	2458	120	Bn	23 (1) v (2) 25	11·2
13	2458	90	Bh	21−1, 23+1	11·0
14	2459	60	D	26−2, 30+2	11·6
17	2462	90	Bh	=23	11·1
19	2464	120	Bn	25 (1) v (2) 30	11·4
21	2466	150	„	23 (3) v (1) 30	11·5
21	2466	90	Bh	23−1, 30+2	11·2
22	2467	94	Ni	23 (1) v (4) 30	11·2
23	2468	90	Bh	23−1	11·2
23	2468	150	Bn	23 (3) v (1) 30	11·5
29	2474	„	„	23 (5) v (1) 30	11·5
29	2474	90	Bh	21−4, 23−2	11·3
June					
2	2478	„	„	=23	11·1*b*
4	2480	„	„	21−4, 23−1	11·3
5	2481	150	Bn	30−1	11·7
8	2484	„	„	23 (7) v (2) 30	11·5
8	2484	94	Ni	23 (3) v (2) 30	11·4
9	2485	60	D	25−2, 30+0·5	11·5*b*
11	2487	120	„	25−3, 30+1	11·6
15	2491	90	Bh	23−2, 30+2	11·4
18	2494	„	„	23−2, 30+2	11·4
18	2494	150	Bn	23 (3) v (1) 30	11·5
22	2498	60	D	=30	11·6*b*
22	2498	79	Ma	23 (1) v (1) 30	11·4
23	2499	90	Bh	30+1	11·5
29	2505	„	„	23−2, 30+2	11·4
July					
7	2513	„	„	=23	11·1
9	2515	60	D	30+1	11·5*b*
9	2515	94	Ni	23 (2) v (4) 30	11·3

June 2, Red.
June 22, D, Difficult.

(6849) R AQUILÆ—*continued.*

1920					
July					
10	2516	90	Bh	21−3, =23	11·2
14	2520	150	Bn	23 (1) v (4) 30	11·2
16	2522	94	Ni	23+1	11·0
19	2525	120	Bn	23 (1) v (3) 30	11·2
19	2525	60	D	25−2, 30+1	11·5*b*
19	2525	90	Bh	23−2, 30+2	11·4*b*
24	2530	,,	,,	15−8, 21−1, 23+2	10·9*b*
24	2530	94	Ni	13 (7·5) v (2·5) 23	10·7*b*
26	2532	90	Bh	21−1, 23+1	11·0*b*
28	2534	120	Bn	21−1, 23+3	10·9*b*
30	2536	90	Bh	15+1	10·0
Aug					
1	2538	120	Bn	21+1	10·8*b*
2	2539	90	Bh	=15, 23+10	10·1
3	2540	94	Ni	13 (6) v (3) 23	10·6
5	2542	79	Ma	13−2	9·7
6	2543	75	Bn	15 (2) v (1) 21	10·6
6	2543	90	Bh	11−6, 15+3	9·8
8	2545	,,	,,	11−4, 15+5	9·0*b*
9	2546	75	Bn	15 (2) v (1) 21	10·6
10	2547	79	Ma	13 (2) v (3) 25	10·2
13	2550	90	Bh	12−3, 15+3	9·8
14	2551	75	Bn	15 (1) v (2) 21	10·4
16	2553	70	Bo	12 (3) v (1) 13	9·5
16	2553	30	D	15−7, 23+3	10·8*b*
19	2556	90	Bh	11−1, 13+1	9·4
19	2556	75	Bn	12 (4) v (1) 15	10·0
22	2559	,,	,,	12 (3) v (1) 15	10·0
22	2559	79	Ma	13+1	9·4
26	2563	75	Bn	12 (1) v (2) 15	9·7
26	2563	90	Bh	=12, =13	9·5*b*
28	2565	,,	,,	11−1, 12+1	9·4
30	2567	75	Bn	12 (3) v (2) 15	9·9
Sept					
1	2569	90	Bh	8−3, =11	9·2*b*
4	2572	,,	,,	11+3, 12+5	9·0
6	2574	45	,,	=5, =6	8·4
6	2574	50	Ma	7 (1) v (4) 8	8·9
6	2574	75	Bn	12 (1) v (3) 15	9·6
8	2576	23	Bo	6 (1) v (1) 7	8·7
8	2576	30	D	5−5, 8+1	8·8*b*
9	2577	75	Bn	10 (3) v (1) 11	9·2
9	2577	94	Ni	=5, 7+0·5	8·6
9	2577	...	Gr	6 (1) v (1) 7	8·7
10	2578	79	Ma	=5	8·3
10	2578	45	Bh	=5, =6	8·4*b*
12	2580	23	Bo	4 (1) v (3) 5	8·0
12	2580	30	Bn	5 (2) v (5) 6	8·4
12	2580	...	Gr	6 (1) v (1) 7	8·7
12	2580	22	Ni	5 (2) v (2) 7	8·6
13	2581	45	Bh	=5, =6	8·4*b*
15	2583	...	Gr	5 (1) v (1) 6	8·4
18	2586	...	,,	5−0·5	8·4
18	2586	30	Bn	3+1·5	7·7
18	2586	50	Ma	A (2) v (1) 3, 4+2·5	7·7
19	2587	23	Bo	2 (7) v (1) 3	7·8
19	2587	90	Bh	3+3, 4+3, 5+5	7·7

1920					
Sept					
19	2587	22	Ni	D (4) v (1) N	7·
21	2589	...	Gr	3 (1) v (1) 4	7·
23	2591	...	,,	3+1, 4+1	7·
25	2593	...	,,	=A	7·
26	2594	30	Bn	2−1, A−2	7·
26	2594	45	Bh	2+2	7·
27	2595	...	Gr	A+4	6·
28	2596	45	Bh	1−6, 2+3	6·
28	2596	22	Ni	D (4) v (4) N	7·
29	2597	23	Bo	2 (1) v (2) 3	7·
29	2597	30	Bn	2+3, A+2	7·
29	2597	50	Ma	A+1	7·
29	2597	...	Gr	A+4	6·
30	2598	...	,,	2+4	6·
Oct					
1	2599	45	Bh	1−5, 2+5	6·
1	2599	22	Ni	D (6) v (4) N	7·
2	2600	50	Ma	A+2	7·
2	2600	30	Bn	1 (4) v (1) A	7·
4	2602	23	Bo	1 (3) v (1) 2	6·
4	2602	...	Gr	2+4	6·
6	2604	30	Bn	1 (5) v (2) A	6·
6	2604	45	Bh	=1	6·
6	2604	...	Gr	1−4	6·
7	2605	...	,,	1−2	6·
8	2606	45	Bh	1−2	6·
8	2606	22	Ni	=D	7·
9	2607	23	Bo	1 (1) v (2) 2	6·
9	2607	30	Bn	1 (2) v (1) 2	6·
10	2608	,,	,,	1 (3) v (2) A, A+5	6·
12	2610	45	Bh	1−2	6·
12	2610	...	Gr	1−2	6·
13	2611	...	,,	1−1	6·
13	2611	25	Bn	1 (5) v (2) A	6·
13	2611	50	Ma	1 (1) v (1) A	6·
14	2612	23	Bo	1 (1) v (3) 2	6·
15	2613	...	Gr	=1	6·
17	2615	22	Ni	1 (6) v (1) F	6·
17	2615	45	Bh	=1	6·
18	2616	,,	,,	1+1	6·
18	2616	30	Bn	1−1·5	6·
18	2616	50	Ma	1−1	6·
19	2617	23	Bo	1 (1) v (4) 2	6·
20	2618	30	Bn	1+1	6·
21	2619	...	Gr	=1	6·
22	2620	22	Ni	H (6) v (2) 1	6·
22	2620	45	Bh	1+1	6·
23	2621	30	Bn	1+1·5	6·
23	2621	...	Gr	=1	6·
24	2622	30	D	1+0·5	6·
24	2622	45	Bh	1+1	6·
25	2623	30	Bn	1+1	6·
25	2623	...	Gr	=1	6·
26	2624	...	,,	1+1	6·
26	2624	23	Bo	1 (1) v (4) 2	6·
27	2625	30	Bn	1+1	6·
27	2625	22	Ni	H (10) v (1·5) 1	6·

July 10, Red. Not steady.
July 24, Ni, Unsteady. Aug. 1, t.
Aug. 5, Pale red.
Aug. 16, D, Difficult.
Aug. 22, Ma, Pale red.
Sept. 6, Ma, Red.
Sept. 9, Ni, With 22, 8·5.
Sept. 10, Ma, Red.
Sept. 18, Ma, Red.

Sept. 29, Ma, Red.
Oct. 2, Ma, Red.
Oct. 6, Bh, Orange.
Oct. 13, Ma, Pale red.
Oct. 17, Bh, Orange.
Oct. 18, Bh, Yellow.
Oct. 18, Ma, Pale yellow.
Oct. 22, Ni, Difficult.
Oct. 24, D, Difficult.

(6849) R AQUILÆ—*continued.*

1920					
Oct					
28	2626	...	Gr	1+1	6·0
29	2627	30	Bn	1−0·5	6·2
29	2627	45	Bh	1+1	6·0
31	2629	23	Bo	=1	6·1
Nov					
1	2630	30	Bn	1−1	6·2
3	2632	45	Bh	=1	6·1*b*
4	2633	30	Bn	1−1	6·2
5	2634	...	Gr	=1	6·1
5	2634	45	Br	1+1	6·0
6	2635	22	Ni	H (6) v (2) 1	6·0
6	2635	25	Bn	1−1·5	6·3
6	2635	23	Bo	1 (1) v (9) 2	6·2
7	2636	...	Gr	=1	6·1
9	2638	45	Bh	1−1	6·2
10	2639	...	Gr	1+1	6·0
12	2641	...	,,	1+1	6·0
12	2641	45	Bh	=1	6·1
13	2642	,,	,,	1+1	6·0
14	2643	...	Gr	1+1	6·0
16	2645	...	,,	=1	6·1
16	2645	30	Bn	1 (1) v (3) 2	6·4
17	2646	23	Bo	1+1	6·0
17	2646	30	D	1−0·5	6·2
17	2646	22	Ni	1 (3) v (1) F	6·7
21	2650	,,	,,	1 (5) v (1) F	6·8
21	2650	50	Ma	1 (1) v (1) A	6·7*b*
21	2650	...	Gr	=1	6·1
21	2650	30	Bn	1 (1) v (2) 2	6·5
21	2650	50	Ma	1 (1) v (1) A	6·7*b*
22	2651	45	Bh	1−1	6·2
23	2652	25	Bn	1 (2) v (3) 2	6·5
25	2654	...	Gr	1−2	6·3
Dec					
1	2660	30	Bn	1 (5) v (1) 2	7·0
2	2661	22	Ni	D (3) v (5) N	7·5
3	2662	25	Bn	1 (4) v (1) 2	7·0
3	2662	50	Ma	A+1·5	7·1
6	2665	45	Bh	1−5	6·6
8	2667	,,	,,	1−5	6·6
9	2668	30	Bn	2+1, A+2·5	7·0
9	2668	50	Ma	=A	7·3*b*
12	2671	45	Bh	1−6, 2+4	6·7
17	2676	,,	,,	1−8, 2+2	6·9
21	2680	90	,,	3+5, 4+5	7·4*b*
21	2680	30	Bn	A (3) v (1) 3	7·7
25	2684	45	Bh	2−5, 3+2, 4+2	7·7
26	2685	90	,,	2−4, 3+3, 4+3	7·6
27	2686	22	Ni	N (3) v (1) 5	8·2*b*
28	2687	75	Bn	4 (2) v (1) 5	8·2
31	2690	90	Bh	=3	7·9
1921					
Jan					
6	2696	,,	,,	=3, =4	7·9
10	2700	,,	,,	=4, =5	8·1*b*
10	2700	75	Bn	5 (3) v (1) 6	8·5
13	2703	,,	,,	5 (4) v (1) 6	8·5
13	2703	90	Bh	=5, =6	8·4
16	2706	94	Ni	5 (4) v (1) 7	8·7
30	2720	90	Bh	5−4, 6−3, 12+6	8·8
31	2721	75	Bn	12+1, 13+1	9·4

Nov. 13, Orange.
Nov. 21, Dec. 9, Ma, Pale red.
Dec. 3, Ma, Pale yellow.
Jan. 16, With 22, 8·7.

1921					
Feb					
1	2722	90	Bh	11+1, 12+3	9·2
9	2730	,,	,,	12−1, =13	9·5*b*
17	2738	,,	,,	12−5, 15+2	9·9
17	2738	50	Bn	12 (5) v (1) 15	10·0
19	2740	55	Bo	18 (2) v (1) 19	10·6*b*
Mar					
2	2751	,,	,,	18 (1) v (3) 19	10·5*b*
2	2751	120	Bn	15 (1) v (3) 21	10·3
6	2755	45	Bh	21+2	10·7
7	2756	94	Ni	13 (7) v (2) 23	10·8
11	2760	90	Bh	23+5	10·6
12	2761	94	Ni	13 (8·5) v (2) 23	11·0
14	2763	120	Bn	21 (2) v (1) 23	11·1
15	2764	55	Bo	16 (3) v (1) 19	10·6*b*
16	2765	90	Bh	=21, 23+3	10·9
18	2767	94	Ni	13 (8) v (2·5) 23	10·8
23	2772	90	Bh	23+2	10·9*b*
29	2778	94	Ni	23 (1·5) v (3·5) 30	11·3
30	2779	160	Bo	23 (1) v (3) 25	11·2
31	2780	120	Bn	23 (1) v (3) 30	11·2
Apr					
1	2781	90	Bh	=23	11·1
3	2783	120	Bn	23 (1) v (1) 30	11·4
6	2786	94	Ni	23 (2·5) v (2·5) 30	11·4
7	2787	120	Bn	23 (3) v (1) 30	11·5
8	2788	90	Bh	23−2	11·3
11	2791	60	D	25−3, 30+1	11·6*c*
12	2792	120	Bn	23 (3) v (1) 30	11·5
12	2792	90	Bh	23−1	11·2
19	2799	,,	,,	23−2	11·3
19	2799	120	Bn	23 (7) v (2) 30	11·5
23	2803	90	Bh	23−2	11·3
28	2808	94	Ni	23 (3) v (2) 30	11·4
28	2808	120	Bn	23 (2) v (1) 30	11·4
29	2809	90	Bh	=23	11·1
May					
7	2817	,,	,,	23−1	11·2
8	2818	120	Bn	21 (2) v (1) 23	11·1
9	2819	90	Bh	21−4, 23−2	11·3
15	2825	,,	,,	23−1	11·2
15	2825	120	Bn	21+1·5	10·7
19	2829	94	Ni	13 (10) v (2) 23	10·9
21	2831	90	Bh	21−1, 23+1	11·0
21	2831	120	Bn	21 (3) v (2) 23	11·0
24	2834	,,	,,	21 (1) v (1) 23	11·0
28	2838	30	D	13 (4) v (1) 23, 23+3	10·8*b*
29	2839	94	Ni	13 (8) v (4) 23	10·6
29	2839	50	Gr	13−6, 21+6	10·2
31	2841	30	D	13−6, 23+10	10·1
31	2841	90	Bh	=15	10·1
June					
2	2843	,,	,,	13−3, 15+3	9·8
4	2845	50	Gr	13−6, 21+6	10·2
5	2846	94	Ni	13 (5) v (5) 23	10·3
5	2846	90	Bh	12−2, 13−2	9·7
6	2847	50	Bn	15 (3) v (2) 21	10·6
6	2847	30	D	13−5, 23+3	9·9
8	2849	50	Gr	11−8, 21+8	10·1
10	2851	90	Bh	=11, 12+2, 13+2	9·3
11	2852	50	Bn	15+0·5	10·1
12	2853	,,	Gr	=13	9·5
14	2855	55	Bo	11 (1) v (3) 12	9·3

April 3, 7, 12, 19, Bn, t.
April 11, Difficult.
May 28, Difficult.
June 2, Orange.

(6849) R AQUILÆ—*continued.*

1921					
June					
15	2856	90	Bh	13=1	9·6*b*
16	2857	60	D	13 (1) v (2) 23, 13=5	10·0
17	2858	75	Bn	12 (3) v (1) 15	10·0
21	2862	90	Bh	=11, =12	9·4*b*
22	2863	50	Gr	13+2	9·3
23	2864	,,	Bn	12 (5) v (2) 15	9·0
24	2865	60	D	11=2, 13+1	9·4
24	2865	94	Ni	7 (4) v (2) 13	9·3
24	2865	50	Gr	=11	9·3
24	2865	90	Bh	7=2, 11+2	9·1
26	2867	32	Ca	13=3, 15+3	9·8
27	2868	90	Bh	=7, 8+1	8·8
28	2869	75	Bn	12 (1) v (3) 15	9·6
28	2869	50	Gr	=7	8·9
29	2870	50	D	11=2, 13+1, =11	9·4
30	2871	50	Gr	=7	8·9
July					
2	2873	90	Bh	=5, =6	8·4
2	2873	50	Ma	7 (1) v (3) 8	8·9
2	2873	22	Ni	5 (5) v (1) 7	8·8
4	2875	50	Gr	=7	8·9*b*
4	2875	30	D	8=1, 11+3	9·0
5	2876	75	Bn	11 (3) v (2) 12	9·4
7	2878	22	Ni	5 (6) v (1) 7	8·8
7	2878	45	Bh	2=5, 3+2	7·7
8	2879	50	Bn	5 (1) v (1) 8,	8·6
				6 (1) v (2) 7	
9	2880	30	D	5=3, 8+2	8·7
9	2880	50	Gr	7+2	8·7
10	2881	,,	Ma	5 (1) v (1) 8	8·6
11	2882	90	Bh	3+3, 4+5	7·1
11	2882	30	D	5=3, 8+3	8·6
12	2883	50	Bn	5 (1) v (2) 8	8·5
13	2884	30	D	5 (1) v (3) 8, 5=3	8·5
13	2884	50	Gr	5=3	8·6
20	2891	30	Bn	2=5, 3+2	7·7
21	2892	,,	D	3=2, 5+2	8·1*b*
21	2892	50	Gr	=3	7·9*b*
24	2895	,,	,,	=3	7·9
25	2896	30	Bn	2 (5) v (2) 3	7·7
25	2896	,,	D	=3	7·9
26	2897	,,	,,	3+2	7·7
26	2897	45	Bh	1=5, 2+5	6·6
28	2899	30	D	A=3, 3+3	7·6*b*
29	2900	50	Gr	2=2	7·1
29	2900	45	Bh	1=5	6·6
30	2901	30	D	A=3, 3+4	7·5
Aug					
1	2903	,,	,,	A+2	7·1
2	2904	,,	Bn	2+2, A+4·5	7·0
3	2905	,,	D	A+3	7·0
4	2906	50	Gr	=4	7·2
6	2908	45	Bh	1=1	6·2
6	2908	30	D	1 (4) v (1) A, A+3	7·0*b*
7	2909	,,	,,	1 (3) v (1) A, A+4	6·9*b*
7	2909	50	Ma	A+2	7·1
8	2910	30	Bn	1 (2) v (1) 2	6·8
9	2911	55	Bo	1(1) v (3) 2	6·4*b*
9	2911	25	Gr	1=2	6·3
10	2912	30	D	1 (3) v (1) A, A+4	6·9*b*
12	2914	45	Bh	=1	6·1
14	2916	,,	,,	1+2	5·9
15	2917	,,	,,	1+2	5·9

July 10, Pale yellow.
Aug 7, Ma, Orange, with touch of red.
Aug. 15, Orange.

1921					
Aug					
17	2919	22	Ni	1 (2) v (4) F	6·2
18	2920	30	D	1 (1) v (3) A, 1=3	6·2
19	2921	45	Bh	1+4	5·7
21	2923	30	D	1+3	5·8
21	2923	25	Gr	1+2	5·9
22	2924	45	Bh	1+4	5·7
23	2925	55	Bo	1+2	5·9
23	2925	30	D	1+4	5·7
25	2927	,,	Bn	1+3	5·8
25	2927	45	Bh	1+2	5·9
25	2927	25	Gr	1+2	5·9
26	2928	22	Ni	H (6) v (4) 1	5·9
26	2928	30	D	1+5	5·6
27	2929	B	,,	H=4, 1+1	6·0
28	2930	30	,,	1+5	5·6
30	2932	,,	,,	1+4	5·7
30	2932	45	Bh	1+4	5·7
30	2932	F	Bo	1+2	5·9
Sept					
1	2934	25	Gr	1+2	5·9
1	2934	30	D	1+3	5·8
1	2934	,,	Bn	1+1	6·0
3	2936	,,	,,	1+2	5·9
3	2936	,,	D	1+4	5·7
4	2937	45	Bh	1+1	6·0
4	2937	55	Bo	1+3	5·8
5	2938	30	Bn	1+2	5·9
5	2938	B	D	=1	6·1
6	2939	30	,,	1+4	5·7
6	2939	22	Ni	1+2	5·9
6	2939	45	Bh	1+1	6·0
6	2939	,,	Br	1+2	5·9
7	2940	30	Bn	1+2	5·9
9	2942	,,	,,	1+2	5·9
10	2943	45	Bh	1+2	5·9
15	2948	30	Bn	1=1	6·2
16	2949	22	Ni	1+1·5	6·0
16	2949	30	D	=1	6·1
21	2954	45	Bh	1+2	5·9
21	2954	30	Bn	1=1·5	6·2
22	2955	,,	D	1 (1) v (5) A, 1=2	6·2
23	2956	55	Bo	1 (1) v (7) 2	6·2
24	2957	30	Bn	1 (2) v (5) 2	6·2
24	2957	45	Bh	1+1	6·0
24	2957	22	Ni	1 (3) v (2) F	6·0
25	2958	50	Ma	1 (2) v (1) A	6·0
25	2958	30	D	1 (1) v (3) A, 1=3	6·2
25	2958	55	Bo	1 (1) v (5) 2	6·2
26	2959	25	Gr	1=2	6·2
27	2960	,,	Bn	1 (1) v (2) 2	6·2
29	2962	30	D	1 (3) v (1) A, A+4	6·0
30	2963	45	Bh	1=3, 2+7	6·2

Aug. 19, Yellow.
Aug. 23, D, Difficult.
Aug. 25, Bn, With B, 6·0*b*.
Aug. 26, D, With B, 5·9.
Aug. 28, With B, 5·9.
Aug. 30, D, With B, 6·0.
Sept. 1, D, With B, 6·0.
Sept. 3, Bn, With B, 5·9; D, With B, 6·0.
Sept. 5, Bn, With B, 6·0.
Sept. 6, D, With B, 6·0.
Sept. 10, Yellow.
Sept. 16, D, About. Difficult.
Sept. 21, 24, Bh, Orange.

(6849) R AQUILÆ—*continued.*

1921					
Sept					
30	2963	55	Bo	1 (2) v (3) 2	6·5
30	2923	32	Ca	3+4	7·5
Oct					
1	2964	45	Br	1−5	6·6
1	2964	30	Bn	1 (3) v (1) 2	6·9
4	2967	50	Ma	A (1) v (1) 3	7·6
5	2968	25	Gr	=2	7·2
5	2968	45	Bh	2+4	6·8
5	2968	30	Bn	2+5, A+3	6·8
6	2969	55	Bo	1 (2) v (1) 2	6·8
6	2969	22	Ni	D (6) v (2) N	7·7
8	2971	25	Bn	2+1·5	7·0
9	2972	45	Bh	1−8, 2+2	6·9
9	2972	30	D	A+1	7·2
14	2977	25	Bn	2−2, A−1	7·4
14	2977	,,	Gr	2−1	7·3
15	2978	22	Ni	N (1) v (5) 5	7·9
15	2978	45	Bh	1−5, 2+5	6·6
17	2980	55	Bo	2 (3) v (4) 3	7·5*b*
18	2981	25	Bn	2−3, 3+4	7·5
20	2983	,,	Gr	3+2	7·7
23	2986	50	Ma	=3, 5+2	8·0
23	2986	,,	Bn	2 (4) v (1) 3	7·7
23	2986	45	Bh	2−2	7·4
27	2990	90	,,	2−3, 3+3	7·5
30	2993	50	Bn	3+1	7·8
31	2994	55	Bo	2 (5) v (1) 3	7·7
Nov					
1	2995	90	Bh	−3	7·9
6	3000	22	Ni	5 (4) v (1) 7	8·7
6	3000	50	Bn	4 (1) v (2) 5	8·1
9	3003	90	Bh	4−2, 5+2	8·1
12	3006	50	Bn	5 (1) v (2) 6	8·4*b*
17	3011	,,	Gr	−7	8·9
19	3013	55	Bo	6 (1) v (1) 7	8·7
22	3016	90	Bh	5−2, 7+3	8·5
22	3016	94	Ni	7 (3) v (1) 13	9·3
22	3016	32	Ca	10−2, 13+2	9·3
23	3017	50	Bn	6 (3) v (1) 7, 8+1	8·8
24	3018	90	Bh	=7, =8	8·9
25	3019	55	Bo	6 (1) v (3) 7	8·6*b*
26	3020	90	Bh	−7, =8	8·9
27	3021	50	Bn	5 (3) v (1) 6	8·5
27	3021	94	Ni	7 (2) v (2) 13	9·2
30	3024	50	Gr	=11	9·3
Dec					
3	3027	90	Bh	11+2, 12+4, 13+5	9·0
4	3028	50	Bn	12 (1) v (2) 15	9·7
4	3038	90	Bh	=12, =13	9·5*b*
5	3039	,,	,,	15+3, 21+10	9·9
12	3046	50	Bn	15 (1) v (1) 21	10·5
13	3047	90	Bh	15	10·1
14	3048	94	Ni	13 (4) v (3) 23	10·4
15	3049	75	Bn	12 (3) v (1) 15	10·0
15	3049	90	Bh	15	10·1
18	3052	75	Bn	15 (1) v (2) 21	10·4
20	3053	90	Bh	15	10·1*b*
31	3055	75	Bn	21+1	10·8
1922					
Jan					
21	3076	90	Bh	21+1, 23+3	10·8
1922					
Feb					
17	3103	90	Bh	23−1	11·2
25	3111	94	Ni	=30	11·6
Mar					
4	3118	90	Bh	23−3, 30+1	11·5
17	3131	94	Ni	=30	11·6
19	3133	90	Bh	23−3, =30	11·5*b*
28	3142	,,	,,	=30	11·6
31	3145	,,	,,	=30	11·6
31	3145	94	Ni	23 (2) v (2) 30	11·4*b*
Apr					
2	3147	80	Ca	24−1, 26+1	11·5
4	3149	90	Bh	23−2, 30+2	11·4
14	3159	,,	,,	21−5, 23−1	11·3
17	3162	120	Bn	23 (2) v (1) 30	11·4
18	3163	90	Bh	=23	11·1
19	3164	94	Ni	=23	11·1
23	3168	90	Bh	=23	11·1
29	3174	,,	,,	23+1	11·0
May					
2	3177	,,	,,	23+1	11·0
2	3177	120	Bn	23+1	11·0
6	3181	50	,,	21 (2) v (1) 23	11·1
6	3181	90	Bh	21−1, 23+1	11·0*b*
8	3183	,,	,,	21+1, 23+3	10·8
14	3189	120	Bn	21 (1) v (1) 23	11·0
17	3192	90	Bh	=15	10·1
18	3193	80	Ca	22−1, 23+1	11·0
19	3194	50	Bn	15 (2) v (1) 21	10·6
21	3196	,,	,,	15 (1) v (2) 21	10·4
21	3196	94	Ni	13 (5) v (4) 23	10·4
22	3197	70	Gr	13−5	10·0
24	3199	,,	,,	=13	9·5
26	3201	90	Bh	=12, =13	9·5
27	3202	50	Bn	12 (3) v (1) 15	10·0
27	3202	80	Co	12−2, 13−1	9·6
27	3202	94	Ni	13 (3) v (4) 23	10·2
28	3203	45	Br	=7, =8	8·9
28	3203	90	Bh	=11, 12+2	9·3
29	3204	80	Co	13+2	9·3*b*
31	3206	70	Gr	11+2	9·1
June					
1	3207	94	Ni	5+3, 7+4	8·2
1	3207	50	Bn	5 (1) v (3) 7	8·4
4	3210	,,	,,	4 (1) v (1) 5	8·1
4	3210	90	Bh	4−4, 5−1, 6+1, 7+4	8·4
5	3211	50	Gr	5+1	8·2
6	3212	,,	Bn	3 (1) v (2) 4	7·9
12	3218	45	Bh	2−1, 3+6	7·3
15	3221	,,	,,	1−7, 2+2	6·9
15	3221	80	Co	=A	7·3*b*
16	3222	50	Gr	=2	7·2
19	3225	45	Bh	1+1	6·6
20	3226	80	Co	1−6, A+5	6·7*b*
22	3228	45	Bh	=1	6·1*b*
23	3229	50	Gr	1−2	6·3*b*
25	3231	80	Co	1−6, A+5	6·7
26	3232	45	Bh	=1	6·1
27	3233	50	Gr	1−2	6·3
29	3235	80	Co	1−4, A+8	6·5

Oct. 4, Pale red.
Oct. 23, Bh, Orange.
Nov. 22, Ni, With 22, 9·0.
Nov. 27, Ni, With 22, 9·6.

April 17, t.
May 27, Ni, With 22, 8·8.
June 1, Ni, With 22, 8·8.
June 15, Co, Ruddy.
June 20, 25, 29, Co, Orange.
June 23, Red.

(6849) R AQUILÆ—*continued.*

1922					
June					
29	3235	45	Bh	=1	6·1
July					
1	3237	50	Gr	1−1	6·2
2	3238	45	Bh	1+1	6·0
2	3238	32	Ca	M−2, c+10	6·8
3	3239	80	Co	1−4, A+8	6·5
9	3245	50	Gr	1−5	6·6
10	3246	45	Bh	1−3	6·4
11	3247	80	Co	A+4	6·9
12	3248	22	Ni	F (6) v (2·5) D	7·2
14	3250	45	Bh	1+1	6·0
16	3252	50	Gr	1−5	6·6
18	3254	45	Br	1−6, 2+4	6·7
18	3254	30	Bn	1 (4) v (1) 2	7·0
18	3254	50	Ma	A+1	7·2
18	3254	80	Co	=A	7·3
20	3256	,,	,,	A+1	7·2
20	3256	45	Bh	=1	6·1
20	3256	50	Gr	=2	7·2
21	3257	32	Ca	M−6, c+6	7·2
23	3259	45	Bh	1−3, 2+7	6·4
24	3260	50	Ma	A (3) v (2) 3	7·6
25	3261	,,	Gr	=2	7·2
27	3263	31	D	A (1) v (5) 5, A−2	7·4
27	3263	45	Bh	1−7, 2+3	6·8
28	3264	30	Bn	2+1	7·1
30	3266	50	Gr	2−5	7·7
30	3266	80	Co	=A	7·3
31	3267	45	Bh	1−10, =2	7·1
Aug					
5	3272	,,	,,	2−2, 3+5	7·4
7	3274	30	Bn	=2	7·2
7	3274	22	Ni	N (1·5) v (2·5) 5	8·0
8	3275	80	Co	3+2	7·7
9	3276	50	Gr	3+1	7·8
11	3278	45	Bh	2−3, 3+3	7·5
12	3279	90	,,	3+3, 4+4	7·6
15	3282	30	Bn	2 (5) v (2) 3	7·7
15	3282	,,	D	A (5) v (1) 3	7·8*b*
15	3282	80	Co	3−0·5, 4+1	7·9
17	3284	,,	,,	4−2, 6+3	8·2
17	3284	90	Bh	2−4, 3+2	7·6
17	3284	50	Gr	5+2	8·1*b*
17	3284	,,	Ma	=4	7·9*b*
17	3284	22	Ni	N (5) v (2) 5	8·2
19	3286	30	Co	=3, =4	7·9
20	3287	75	Bn	3+1	7·8
20	3287	45	Bh	3+2, 4+4	7·6
20	3287	22	Ni	=5	8·3
23	3290	75	Bn	4 (1) v (2) 5	8·1
23	3290	30	Co	3−2, 6+3·5	8·1
23	3290	50	Ma	5−2, 12+6	8·7
23	3290	90	Bh	3−1, =4	8·0
25	3292	,,	,,	3−2, =4	8·0
27	3294	22	Ni	5 (4) v (3) 7	8·6
27	3294	30	Co	5−2, 6+1·5	8·4
28	3295	45	Br	3+3	7·6*b*
31	3298	30	Co	=5, 6+2	8·3*b*
31	3298	90	Bh	=4	7·9

July 11, Dull orange.
July 18, Ma, Pure clear red. Co, Red.
July 20, Co, Deep red.
July 24, Pale clear red.
July 30, Co, Deep red.
Aug. 8, Blood red.
Aug. 15, D, 3-in. OG.
Aug. 17, Ma, Pale clear red.

1922					
Sept					
4	3302	90	Bh	4−2, 5+1	8
7	3305	45	,,	=5	8
8	3306	96	Gr	=7	8
9	3307	75	Bn	5 (3) v (1) 6	8
10	3308	22	Ni	5 (4) v (1) 7	8
11	3309	30	Co	6−1, 7+2, 8+1	8
13	3311	,,	,,	6−2, =8	8
15	3313	,,	,,	=7, 8−1	8
15	3313	90	Bh	7−2, 11+2	9
15	3313	75	Bn	6 (2) v (1) 7	8
16	3314	96	Gr	=7	8
18	3316	94	Ni	=7	8
20	3318	50	Gr	11+2	9
20	3318	30	Co	11−1, =13	9
20	3318	50	Bn	=7	8
21	3319	90	Bh	8−3, 11+1	9
24	3322	50	Bn	7 (2) v (1) 10	9
24	3322	30	Co	11−1, =13	9
26	3324	79	Ma	=13	9
26	3324	90	Bh	=11, 12+2	9
29	3327	50	Gr	=11	9
Oct					
2	3330	90	Bh	11−5, 12−2	9
6	3334	,,	,,	12−3, 15+3	9
6	3334	50	Bn	12 (3) v (1) 15	10
6	3334	94	Ni	13 (1) v (6) 23	9
6	3334	30	Co	13−3, =15	10
8	3336	,,	,,	15−1	10
10	3338	,,	,,	15−1, 16+2	10
11	3339	90	Bh	15−2, 21+4	10
12	3340	50	Gr	=21	10
12	3340	,,	Bn	15+1	10
12	3340	30	Co	15−2, 16+2	10
13	3341	,,	,,	=16	10
13	3341	94	Ni	13 (7·5) v (4) 23	10
13	3341	90	Bh	12−6, 15+1	10
14	3342	,,	,,	15−1	10
15	3343	50	Bn	=15	10
16	3344	30	Co	16−2	10
18	3346	90	Bh	15−3, 21+4	10
22	3350	94	Ni	13 (6) v (2·5) 23	10
22	3350	50	Bn	15 (2) v (1) 21	10
25	3353	90	Bh	15−4, 21+2	10
Nov					
1	3360	50	Gr	25+2	11
2	3361	90	Bh	21+1, 23+4	10
4	3363	,,	,,	=21	10
4	3363	120	Bn	21 (1) v (3) 23	10
9	3368	94	Ni	13 (10) v (1) 23	11
9	3368	90	Bh	21−2, 23+2	11
10	3369	50	Gr	=25	11
13	3372	120	Bn	21 (3) v (1) 23	11
13	3372	90	Bh	21−1, 23+2	11
15	3374	30	Co	18−4, =21	10
17	3376	90	Bh	=23	11
18	3377	94	Ni	23 (1) v (3) 30	11
19	3378	90	Bh	=23	11
24	3383	,,	,,	21−3, =23, 25+2	11
24	3383	120	Bn	23 (2) v (3) 30	11
29	3388	,,	,,	23 (2) v (1) 30	11

Sept. 18, With 22, 9·0.
Sept. 26, Ma, Reddish.
Oct. 16, Difficult.

(6849) R AQUILÆ—*continued.*

3390	90	Bh	23−1		11·2
3395	,,	,,	23−2, =25		11·3
3397	94	Ni	23 (3) v (1) 30		11·5
3400	90	Bh	23−3, 25−1		11·4
3403	94	Ni	23 (4) v (1) 30		11·5
3406	90	Bh	23−3, 25−1		11·4
3408	120	Bn	23 (4) v (1) 30		11·5*b*
3410	94	Ni	23−4, =30		11·6
3412	90	Bh	=25		11·3*b*
3414	,,	,,	=25		11·3
3415	94	Ni	30+0·5		11·5
3447	90	Bh	23−4, 25−2		11·5
3455	,,	,,	23−3, 25−1		11·4
3468	94	Ni	13 (7) v (3) 23		10·6
3474	90	Bh	=23, 25+1		11·2
3481	,,	,,	15−4, 21+3		10·6
3492	,,	,,	7−6, 8−5		9·4*b*
3495	22	Ni	=7		8·9
3504	90	Bh	2−6		7·8
3511	45	,,	=2		7·2
3513	22	Ni	D (8) v (2) N		7·7
3517	,,	,,	D (6) v (3) N		7·7
3519	45	Bh	1−7, 2+3		6·8*b*
3524	,,	,,	1−4		6·5
3525	22	Ni	=D		7·4
3526	45	Bh	1−−2		6·3
3530	30	Bn	1−2		6·3
3532	45	Bh	=1		6·1
3534	30	D	1 (1) v (5) A, 1−2		6·3
3537	45	Bh	1+2		5·9*b*
3541	,,	,,	1+2		5·9
3545	30	D	1+5		5·6
3545	22	Ni	1+4·5		5·7
3549	45	Bh	1+2		5·9
3551	F	Lp	v (1) 1 (4) 2		5·9
3553	30	D	1+4		5·7
3556	,,	Bn	1+3		5·8
3556	F	Lp	v (1) 1 (4) 2		5·9
3557	45	Bh	1+2		5·9
3558	22	Ni	1+5		5·6
3561	25	Bn	1+3		5·8
3565	30	,,	1+2		5·9
3565	,,	D	1+2		5·9
3565	37	Lp	v (1) 1 (4) 2		5·9*b*
3570	45	Bh	1+1		6·0
3573	,,	,,	=1		6·1
3577	30	D	1 (1) v (3) A, 1−3		6·4
3581	,,	,,	1−2		6·3
3581	F	Lp	1 (2) v (2) 2		6·6*b*
3582	30	Bn	1−1		6·2

April 24, 8c.
May 5, D, 6c, With B, 6·5. Ni, 5c.
May 13, 6c, With B, 6·0.
May 16, Bn, With B, 5·8. Lp, With 37, 5c.
May 17, Yellow.
May 25, D, With B, 6·0. Lp, 6c.
May 30, Orange.
June 6, 7c.

1923 June 11	3582	45	Bh	1+1	6·0
17	3588	37	Lp	1 (3) v (2) 2	6·7*b*
21	3592	45	Bh	1−2	6·3
22	3593	37	Lp	1 (2) v (1) 2	6·8*b*
23	3594	45	Bh	1−2	6·3
26	3597	30	D	1 (4) v (1) A, A+3	7·0
29	3600	37	Lp	=2	7·2*b*
July 2	3603	...	Gr	1−9, 3+9	7·0
4	3605	37	Lp	2 (1) v (4) 3	7·3*b*
4	3605	30	D	A−3, 3+3	7·6
4	3605	22	Ni	D (6) v (2) N	7·7
5	3606	45	Bh	1−5, 2+5	6·6
6	3607	30	Bn	2−1	7·3
7	3608	,,	D	A−4, 3+3	7·6
8	3609	...	Gr	3+6	7·3
8	3609	37	Lp	2 (2) v (2) 3	7·5*b*
8	3609	45	Bh	2+2	7·0
9	3610	22	Ni	D (7·5) v (1) N	7·7
12	3613	37	Lp	2 (7) v (3) 3	7·7*b*
13	3614	30	D	A−4, 3+2	7·7
16	3617	,,	,,	A−3, 3+3	7·6
18	3619	37	Lp	2 (4) v (1) 3	7·7
19	3620	...	Gr	3+2	7·7
20	3621	45	Bh	2−3, 3+4	7·5
20	3621	30	D	A−4, 3+1	7·7
21	3622	22	Ni	N (5) v (2) 5	8·2
21	3622	34	Li	2 (3) v (7) 3	7·4
21	3622	30	Bn	2 (4) v (1) 3	7·7
22	3623	37	Lp	=3	7·9*b*
26	3627	,,	,,	=4, =5	8·1*b*
29	3630	...	Gr	=3	7·9
30	3631	45	Bh	=3, =4	7·9
Aug. 1	3633	22	Ni	5 (3) v (3) 7	8·6
3	3635	50	Bn	3 (1) v (1) 4	7·9
3	3635	90	Bh	3−4, =4, 5+3	8·1
4	3636	51	Ma	5−2, =8	8·7
7	3639	,,	,,	5−3, 11+2	8·8
8	3640	50	Bn	4 (2) v (1) 5	8·2
8	3640	90	Bh	=5, =6	8·4*b*
11	3643	30	D	=8	8·9
11	3643	90	Bh	=6, 7+2	8·6*b*
11	3643	37	Lp	6 (2) v (2) 11, =8	8·9*b*
12	3644	51	Ma	5−4, 12+2	9·0
13	3645	50	Bn	5 (2) v (1) 6	8·4
14	3646	51	Ma	=11	9·3
15	3647	90	Bh	7−2, 11+3	9·0
15	3647	37	Lp	=11	9·3*b*
21	3653	,,	,,	12 (2) v (2) 13	9·5*b*
21	3653	51	Ma	11 (1) v (3) 13	9·3
23	3655	90	Bh	8−2, 11+2	9·1
28	3660	,,	,,	=11, =12	9·4*b*
28	3660	51	Ma	11 (3) v (1) 13	9·4
29	3661	...	Gr	=13	9·5
30	3662	50	Bn	=13	9·5
30	3662	100	Lp	13 (2) v (2) 15	9·8*b*
30	3662	90	Bh	11−3, =13	9·5*b*
Sept. 1	3664	60	D	13−4, 15+2	9·9
2	3665	94	Ni	13 (7) v (3) 23	10·6
2	3665	90	Bh	12−5	10·0

June 11, Bh, Orange.
June 23, Yellow.
Aug. 4, Pale red.

(6849) R AQUILÆ—*continued.*

1923 Sept					
2	3665	51	Ma	13−2	9·7
3	3666	37	Lp	=15	10·1*b*
4	3667	90	Bh	12−5, =13	10·0
5	3668	50	Bn	15 (1) v (3) 21	10·3
7	3670	100	Lp	=16	10·3
7	3670	90	Bh	=15	10·1*b*
8	3671	50	Bn	15+1	10·0
9	3672	94	Ni	13 (7) v (2·5) 23	10·7
10	3673	90	Bh	15−3, 21+5	10·4
10	3673	160	Br	13−3	9·8
11	3674	100	Lp	=18	10·5*b*
12	3675	60	D	23+4	10·7
13	3676	90	Bh	15−5, 21+3	10·6
15	3678	100	Lp	13 (4) v (1) 23, 10 (2) v (2) 20	10·8
15	3678	50	Bn	15 (1) v (1) 21	10·5
16	3679	79	Ma	=21, 23+5, 30+7	10·8
16	3679	90	Bh	21+2	10·7
18	3681	94	Ni	13 (9) v (2·5) 23	10·8
21	3684	120	Bn	21 (1) v (1) 23	11·0*b*
21	3684	100	Lp	21 (2) v (2) 23	11·0*b*
21	3684	90	Bh	21	1, 23	4	10·8
26	3689	,,	,,	=21	10·9
29	3692	50	Bn	23+1	11·0
30	3693	100	Lp	=26	11·6*b*
30	3693	94	Ni	23 (3) v (3) 30	11·4
30	3693	90	Bh	21, 23	2	10·9
Oct					
4	3697	120	Bn	23 (1) v (1) 30	11·4
4	3697	100	Lp	=25	11·3*b*
4	3697	79	Ma	23 (1) v (2) 30	11·3
4	3697	90	Bh	21−1, 23+2	11·0
7	3700	,,	,,	23+1	11·0
9	3702	,,	,,	=23	11·1
12	3705	79	Ma	23 (1) v (1) 30	11·4
13	3706	70	Gr	23, 2, 30	2	11·4
14	3707	120	Bn	23 (2) v (1) 30	11·4
16	3709	90	Bh	23−1	11·2
19	3712	,,	,,	23−1	11·2
21	3714	79	Ma	=30	11·6*b*
22	3715	120	Bn	23 (3) v (1) 30	11·5
23	3716	90	Bh	23−2	11·3
25	3718	94	Ni	23 (5) v (0·5) 30	11·5
28	3721	120	Bn	23 (3) v (1) 30	11·5
30	3723	70	Gr	=30	11·6
Nov					
1	3725	90	Bh	23−2	11·3
2	3726	100	Lp	=30	11·6*b*
3	3727	120	Bn	23 (3) v (1) 30	11·5
3	3727	90	Bh	23−3	11·4
4	3728	94	Ni	30−1	11·7
4	3728	120	D	30−5	12·1*b*
7	3731	,,	Bn	23 (3) v (1) 30	11·5
7	3731	90	Bh	23−4, =30	11·6
10	3734	,,	,,	23−1, 30+3	11·3
11	3735	94	Ni	=30	11·6
14	3738	120	Bn	23 (3) v (1) 30	11·5
16	3740	90	Bh	23−1, 30+3	11·3
23	3747	,,	,,	23−1	11·2*b*
30	3754	,,	,,	=23	11·1
30	3754	120	Bn	23 (2) v (1) 30	11·4
Dec					
4	3758	,,	,,	23 (1) v (1) 30	11·4
4	3758	90	Bh	=23	11·1

Sept. 30, Lp, Difficult.
Nov. 2, Difficult.

1923 Dec					
6	3760	90	Bh	23+1	11·0
6	3760	94	Ni	23 (5) v (1) 30	11·4
8	3762	90	Bh	23+1	11·0
9	3763	50	Ry	30	3	11·5
11	3765	80	,,	23−2, 25+2, 24+2, 30+4	11·0
11	3765	94	Ni	23 (2) v (3) 30	11·4
15	3769	120	Bn	21−2, 23+0·5	11·0
17	3771	80	Ry	23−1·5, 25+1	11·0
18	3772	120	Bn	21 (2) v (1) 23	11·0
18	3772	90	Bh	21−2, 23+2	11·0
24	3778	,,	,,	21+3, 23+6	10·9
25	3779	80	Ry	23+1, 25+2·5	11·0
28	3782	45	Bh	15	3	10·5
31	3785	80	Ry	18	3, 23	4, 25	4	10·5
1924 Jan					
1	3786	45	Bh	15−5	10·5
2	3787	90	,,	12 (2) v (1) 21	10·5
5	3790	,,	,,	13−8, 15	3	10·5
11	3796	45	,,	=15	10·5
14	3799	120	Bn	15 (1) v (2) 21	10·5
16	3801	45	Bh	12 (1) v (1) 15	9·9
23	3808	,,	,,	=12, =13	9·9
26	3811	90	,,	=11, =12, 13+3	9·9
Feb					
1	3817	50	Bn	12 (1) v (3) 15	9·9
1	3817	94	Ni	13 (1) v (6) 23	9·9
3	3819	50	Ry	10−1, 13+2	9·9
14	3830	,,	Bn	3	2	7·5
16	3832	25	,,	2 (5) v (2) 3	7·5
16	3832	22	Ni	N (1) v (2) 5	8·0
Mar					
4	3849	50	Bn	1 (3) v (1) A	7·0
8	3853	22	Ni	O (3) v (3) D	7·0
8	3853	25	Bn	1 (1) v (1) A	6·5
10	3855	45	Bh	1 (1) v (2) 2	6·5
13	3858	25	Bn	1−2	6·5
14	3859	45	Bh	=1	6·5
16	3861	22	Ni	1 (3) v (1·5) O	6·5
19	3864	45	Bh	=1	6·5
26	3871	,,	,,	=1	6·5
29	3874	,,	,,	1−1	6·5
29	3874	22	Ni	1 (3) v (1) O	6·5
Apr					
1	3877	50	Bn	1 (1) v (1) A	6·5
2	3878	45	Bh	1−1	6·5
4	3880	50	Bn	1 (3) v (1) A	7·0
4	3880	45	Bh	1 (1) v (2) 2	6·5
6	3882	,,	,,	1 (1) v (1) 2	6·5
9	3885	50	Bn	2+2, A+3	7·0
11	3887	45	Bh	1 (2) v (1) 2	6·5
14	3890	,,	,,	1 (2) v (1) 2	6·5
17	3893	22	Ni	D (4) v (2) N	7·0
20	3896	45	Bh	1−10, =2	7·0
25	3901	,,	,,	1−10, 2−3	7·0
May					
3	3909	,,	,,	2 (2) v (1) 3	7·0
4	3910	30	D	3−3, 5+3	8·0
5	3911	90	Bh	3+2, 4+3	7·5
5	3911	50	Bn	2−4, 3+3	7·0
7	3913	22	Ni	5+0·5	8·0

Feb. 3, T.
Feb. 16, Ni, Difficult.
Mar. 14, 19, Orange.
Mar. 26, Yellow.

(6849) R AQUILÆ—*continued.*

1924					
May					
13	3919	22	Ni	5 (2) v (2) 7	8·6
16	3922	50	Bn	3 (1) v (1) 4	7·9
22	3928	90	Bh	4 (1) v (1) 6, =5	8·2
25	3931	94	Ni	5 (4) v (1) 7	8·7
26	3932	90	Bh	=5, =6	8·4
27	3933	30	D	8−3, 11+2	9·1
27	3933	37	Lp	=11	9·3*b*
27	3933	50	Bn	6 (2) v (1) 7	8·7
28	3934	90	Bh	5−2, =6	8·5
29	3935	30	Ry	10−0·5, 13−0·5, 15+3·5	9·5
June					
4	3941	,,	,,	13−1, 16+3·5	9·8
4	3941	90	Bh	6−5, 12+5, 13+5	9·0
8	3945	94	Ni	7 (4) v (1) 13	9·4
11	3948	90	Bh	=12, =13	9·5*b*
12	3949	30	Ry	=15, =16	10·2
13	3950	90	Bh	=12, =13	9·5
19	3956	,,	,,	=15	10·1*b*
20	3957	50	Bn	12 (3) v (1) 15	10·0
20	3957	,,	Ry	15−1, =16	10·2
23	3960	100	Lp	=16	10·3*b*
24	3961	90	Bh	=15	10·1*b*
26	3963	30	D	15 (3) v (2) 21, 21+5	10·5
28	3965	90	Bh	12−5, 15−1	10·1
29	3966	80	Ry	18−2, 23+3	10·8
July					
1	3968	60	D	15 (3) v (2) 21, 21+5	10·5
1	3968	90	Bh	15−1	10·2
2	3969	94	Ni	13 (6) v (2) 23	10·7
4	3971	79	Ma	13 (1) v (1) 25	10·4
4	3971	90	Bh	15−2	10·3
6	3973	60	D	15−5, 21+5	10·5
8	3975	50	Ry	18−2, 23+3	10·8
9	3976	94	Ni	13 (10) v (1·5) 23	10·9
9	3976	90	Bh	15 (1) v (1) 21	10·5
11	3978	50	Bn	15 (3) v (1) 21	10·7
14	3981	90	Bh	15 (3) v (2) 21	10·6
18	3985	79	Ma	13 (4) v (1) 25, 23+2, 30+3	11·0*b*
19	3986	120	Bn	23+1	11·0
19	3986	90	Bh	21+2	10·7
19	3986	50	Ry	=23	11·1
20	3987	94	Ni	13 (10) v (1) 23	11·0
24	3991	79	Ma	23+1·5	11·0
24	3991	120	Bn	=23	11·1
24	3991	100	Lp	=23	11·1*b*
24	3991	90	Bh	21+1	10·8
25	3992	50	Ry	25−2, =24	11·5
29	3996	90	Bh	=21	10·9
29	3996	120	Bn	23 (1) v (1) 30	11·4
30	3997	94	Ni	23 (3) v (3) 30	11·4
Aug					
1	3999	80	Ry	23−4, =24	11·5*b*
2	4000	120	Bn	23 (3) v (2) 30	11·4
3	4001	80	Ry	25−3·5, 24−0·5, 30+2	11·5
7	4005	90	Bh	21 (1) v (1) 23	11·0
7	4005	79	Ma	20 (1) v (1) 23, 23−1, 30+1	11·2
7	4005	150	Bn	23 (2) v (1) 30	11·4

May 25, With 22, 9·0.
May 29, June 4, 12, Ry, T.
June 20, July 8, 19, Ry, T.
July 18, Difficult.
July 25, T.

1924					
Aug					
9	4007	120	D	23−4, 30+2	11·5
15	4013	90	Bh	23−1	11·2
17	4015	120	D	=30	11·6
19	4017	150	Bn	23 (3) v (1) 30	11·5
19	4017	90	Bh	23−2	11·3
21	4019	,,	,,	23−2	11·3
24	4022	79	Ma	=30	11·6*b*
27	4025	120	D	30−1	11·7
27	4025	90	Bh	23−3, 30+1	11·5
Sept					
2	4031	,,	,,	30−1	11·7
5	4034	130	Ma	30−1·5	11·7
5	4034	183	Bn	23 (3) v (1) 30	11·5
9	4038	90	Bh	30−2	11·8
12	4041	,,	,,	23−5, 30−1	11·7*b*
12	4041	94	Ni	30−1·5	11·7
16	4045	90	Bh	23−5, 30−1	11·7
22	4051	150	Bn	30−1	11·7
23	4052	100	Lp	=32	12·1*b*
23	4052	90	Bh	23 (3) v (1) 30	11·5
26	4055	,,	,,	23−2	11·3
27	4056	150	Bn	30−1	11·7
29	4058	79	Ma	=30	11·6
Oct					
1	4060	,,	,,	30−1	11·7
1	4060	90	Bh	23−2	11·3
3	4062	150	Lp	30+2	11·4*b*
6	4065	90	Bh	23−3	11·4
11	4070	,,	,,	23−2	11·3
13	4072	,,	,,	23−3	11·4
13	4072	150	Bn	23 (3) v (1) 30	11·5
16	4075	90	Bh	23−2	11·3
22	4081	150	Bn	23 (2) v (1) 30	11·4
23	4082	100	Lp	21 (2) v (2) 23	11·0*b*
23	4082	80	D	23 (3) v (4) 30	11·3
23	4082	94	Li	=23	11·1
23	4082	,,	Ni	23 (3) v (3) 30	11·4
24	4083	90	Bh	=23	11·1
27	4086	,,	,,	21−2, 23+1	11·1
30	4089	50	Ry	=17, =18	10·5
31	4090	90	Bh	21+1	10·8*b*
Nov					
3	4093	,,	,,	15 (1) v (1) 21	10·5
3	4093	120	Bn	21+1	10·8
4	4094	75	Lp	13 (2) v (1) 21	10·4*b*
4	4094	34	Li	13 (2) v (8) 14	9·6
4	4094	94	Ni	13 (7) v (3) 23	10·6
5	4095	90	Bh	15 (2) v (3) 21	10·4
7	4097	,,	,,	15 (1) v (2) 21	10·4
7	4097	94	Ni	13 (3) v (6) 23	10·0
7	4097	44	Li	11 (5) v (5) 12	9·4*b*
8	4098	79	Ma	7−4, 13−2	9·5*b*
10	4100	50	Bn	12−4, 15+2	9·9
10	4100	90	Bh	=12, =13	9·5
15	4105	,,	,,	=7, =8	8·9
16	4106	94	Ni	5 (5) v (1) 7	8·8
16	4106	79	Ma	8−3, 11−1	9·3
16	4106	50	Bn	11 (1) v (1) 12	9·4
17	4107	34	Li	6 (3) v (7) 7	8·6

Sept. 5, Bn, 8½-in. mirror.
Sept. 23, Oct. 3, Lp, Difficult.
Oct. 23, Ni, Unsteady.
Oct. 30, T.
Nov. 4, Ni, Unsteady.
Nov. 16, Ni, With 22, 9·1.. Ma, Pale dull red.

(6849) R AQUILÆ—*continued.*

1924 Nov					
19	4109	45	Bh	6 (1) v (1) 8	8·7
21	4111	,,	,,	5−2, =6	8·5
24	4114	90	,,	=5, =6	8·4
27	4117	22	Ni	5 (3) v (2) 7	8·6
27	4117	50	Bn	4 (2) v (1) 6	8·3
28	4118	90	Bh	3 (1) v (1) 5	8·1
29	4119	,,	,,	=3	7·9
30	4120	50	Bn	4+0·5, 5+3	7·9
Dec					
2	4122	90	Bh	3+2	7·7
5	4125	50	Bn	3+1	7·8
6	4126	90	Bh	2 (1) v (1) 3	7·5
9	4129	45	,,	=2	7·2
1924 Dec					
9	4129	25	Bn	2 (3) v (1) 3, 3+3	7·
10	4130	34	Li	2 (1) v (9) 3	7·
14	4134	94	Ni	N (4) v (4) 5	8·
14	4134	25	Bn	2 (1) v (3) 3	7·
14	4134	45	Bh	1 (2) v (1) 2	6·
19	4139	,,	,,	1 (2) v (1) 2	6·
22	4142	,,	,,	1 (2) v (1) 2	6·
23	4143	22	Ni	N (4) v (3) 5	8·
24	4144	25	Bn	2+1	7·
25	4145	45	Bh	1 (1) v (1) 2	6·
29	4149	20	Ry	D−1	7·

Dec. 14, Ni, Difficult.

(7242) S AQUILÆ. (V. 2.)

H.D. 200715a.

Date.	Julian Date.	Inst.	Observer.	Comparisons.	Deduced Mag.
1918 Jan					
27	1621	90	Bh	53+4	11·2
29	1623	,,	,,	53+3	11·3*b*
Feb					
3	1628	45	,,	50−5, 53+5	11·1*b*
Mar					
4	1657	90	,,	30−4, 41+1	10·0*b*
9	1662	,,	,,	30−1, 41+4	9·7
21	1674	45	,,	=27, 33+4	9·1
25	1678	90	,,	27+1	9·3*b*
Apr					
1	1685	,,	,,	27−1	9·5
12	1696	,,	,,	27−2	9·6
18	1702	,,	,,	27−1	9·5
27	1711	,,	,,	27−3	9·7
May					
8	1722	,,	,,	27−4, =33	9·5
18	1732	,,	,,	27−5, 50+7	9·9
28	1742	,,	,,	=49, =50	10·5
June					
6	1751	,,	,,	49−3, 50−2	10·8
10	1755	,,	,,	49−8, 50−2	11·0
24	1769	,,	,,	50−4, 53+7	10·9
July					
13	1788	45	,,	53+5, 54+6	11·3*b*
26	1801	90	,,	50−3	10·9
30	1805	45	,,	27−10, 50+1	10·4
Aug					
11	1817	90	,,	27−8, 50+4	10·2
18	1824	,,	,,	27−3, 33+1	9·4
24	1830	,,	,,	=27, 33+4	9·1*b*
Sept					
2	1839	,,	,,	27−2, 50+10	9·6*b*
11	1848	,,	,,	27+2, 33+6	8·9
19	1856	,,	,,	27+2, 33+6	8·9
1918 Oct					
8	1875	90	Bh	=27	9
10	1877	,,	,,	27+2	9
15	1882	,,	,,	27−1	9
24	1891	,,	,,	27+2	9
Nov					
5	1903	45	,,	=27	9
13	1911	,,	,,	=27	9
16	1914	,,	,,	27+2	9
25	1923	90	,,	27−4, =33, 50+8	9
30	1928	,,	,,	27−5, 41+2	9
Dec					
3	1931	,,	,,	=41	10
10	1938	,,	,,	33−1	9
14	1942	,,	,,	27−3, 33+1	9
25	1953	,,	,,	27−6, 41+1, 50+6	10
29	1957	150	,,	44+1, 50+3	10
1919 Jan					
10	1969	45	,,	50−5, 53+5	11
22	1981	90	,,	50−6, 53+4	11
26	1985	45	,,	50−5, 53+5	11
Feb					
6	1996	90	,,	41−4, 50+1	10
9	1999	,,	,,	30−4, 41+1	10
28	2018	,,	,,	27−1	9
Mar					
9	2027	,,	,,	27+1	9
15	2033	45	,,	27−1	9
21	2039	,,	,,	27−2, 41+5	9
22	2040	90	,,	27−2, 41+5	9
31	2049	,,	,,	27−1, 41+6	9
Apr					
1	2050	45	,,	27−1	9
12	2061	,,	,,	27−4, 41+4	9
20	2069	90	,,	41−3, 50+2	10
26	2075	,,	,,	27−5, 41+2	9

Oct. 8, Unsteady.

(7242) S AQUILÆ—*continued.*

1919						1920					
May						Mar					
7	2086	45	Bh	=41	10·1	12	2396	90	Bh	53+5, 54+8	11·2
9	2088	,,	,,	41−1, 50+4	10·2	16	2400	,,	,,	50−1	10·7
12	2091	,,	,,	41−2, 50+3	10·3*b*	18	2402	,,	,,	41−3, 50+2	10·4
19	2098	90	,,	=50	10·6	22	2406	,,	,,	27−2	9·6*b*
21	2100	,,	,,	50−1	10·7	25	2409	,,	,,	27+3	9·1
26	2105	45	,,	50−1	10·7	31	2415	,,	,,	27+4	9·0
30	2109	90	,,	50−2	10·8	Apr					
June						9	2424	,,	,,	27+5	8·9
2	2112	,,	,,	50−6, 53+5	11·1*b*	11	2426	45	,,	27+5	8·9
9	2119	45	,,	50−5, 53+5	11·1*b*	17	2432	90	,,	27+1	9·3
13	2123	90	,,	50−5	11·1	27	2442	,,	,,	=27	9·4
21	2131	,,	,,	50−1, 53+10	10·6	May					
28	2138	,,	,,	27−3, 41+4	9·7	4	2449	,,	,,	27+2	9·2*b*
July						9	2454	,,	,,	27+3	9·1
5	2145	45	,,	27+2	9·2	12	2457	,,	,,	27+5	8·9
7	2147	90	,,	27+2	9·2	17	2462	,,	,,	27+4	9·0
20	2160	,,	,,	27+2	9·2	23	2468	,,	,,	27+2	9·2
24	2164	45	,,	27+1	9·3	29	2474	,,	,,	27+4	9·0
Aug						June					
6	2177	90	,,	27−1	9·5	2	2478	45	,,	27+4	9·0
14	2185	,,	,,	27−1	9·5*b*	4	2480	,,	,,	27+2	9·2
19	2190	,,	,,	27−2	9·6	8	2484	90	,,	27+2	9·2
24	2195	,,	,,	27−2	9·6	8	2484	50	Bn	28 (2) v (1) 32	9·7
Sept						15	2491	90	Bh	27−3, 41+4	9·7
7	2209	,,	,,	27−2	9·6	18	2494	,,	,,	27−4	9·8
15	2217	150	,,	27−4	9·8	18	2494	50	Bn	35 (3) v (1) 43	10·4
17	2219	90	,,	=41	10·1	23	2499	45	Bh	27−10, 41−2	10·3
19	2221	,,	,,	41−2, 50+3	10·3	29	2505	,,	,,	50−3, 53+8	10·8
26	2228	,,	,,	41−2, 50+3	10·3	July					
30	2232	,,	,,	41−5, =50	10·6	7	2513	90	,,	50−4	11·0
Oct						9	2515	47	Gl	53−1	11·7*b*
3	2235	,,	,,	50−4, 53+7	10·9	10	2516	90	Bh	50−1	10·7
4	2236	,,	,,	50−6, 53+5	11·1	15	2521	,,	,,	50−5, 53+2	11·2*b*
12	2244	,,	,,	50−6, 53+5	11·1	17	2523	75	Gl	53−1	11·7
16	2248	,,	,,	50−7, 53+4	11·2	19	2525	120	Bn	53 (2) v (1) 54	11·9
22	2254	,,	,,	50−5, 53+5	11·1	19	2525	90	Bh	53−2	11·8
28	2260	150	,,	50−3, 53+8	10·8	24	2530	,,	,,	53−2	11·8
Nov						25	2531	75	Gl	50−2·5, 53+2·5	11·1
3	2266	90	,,	27−7, =41, 50+5	10·1	27	2533	90	Bh	53−2	11·8
10	2273	45	,,	27+3, 41+10	9·1	30	2536	,,	,,	50−7, 53+4	11·2
15	2278	,,	,,	27+4	9·0	30	2536	75	Gl	=41	10·1
21	2284	,,	,,	27+6	8·8	Aug					
24	2287	,,	,,	27+4	9·0	1	2538	94	Gr	=27	9·4
28	2291	90	,,	27+5	8·9	2	2539	90	Bh	27−2, 41+5	9·6
Dec						6	2543	45	,,	27+1	9·3
1	2294	,,	,,	27+6	8·8	7	2544	75	Bn	27 (1) v (2) 28	9·4
7	2300	45	,,	27+3	9·1	7	2544	,,	Gl	27+2·5	9·1
11	2304	,,	,,	27+4	9·0	8	2545	90	Bh	27+5	8·9
16	2309	,,	,,	27+1	9·3	12	2549	43	Gl	27+1·5	9·2
21	2314	,,	,,	=27	9·4	13	2550	90	Bh	27+5	8·9
24	2317	90	,,	=27	9·4*b*	15	2552	75	Bn	=27	9·4
27	2320	,,	,,	27+1	9·3*b*	18	2555	90	Bh	27+5	8·9
1920						19	2556	,,	,,	27+5	8·9
Jan						19	2556	30	Bn	27+1	9·3*b*
1	2325	,,	,,	27−2	9·6	19	2556	43	Gl	26+1	9·1
9	2333	,,	,,	27−4, 50+3	9·8*b*	20	2557	75	Bn	=27	9·4
15	2339	,,	,,	27−6, 50+6	10·0	22	2559	,,	,,	27 (1) v (2) 28	9·4
26	2350	45	,,	27−3, 50+10	9·6*b*	26	2563	90	Bh	27+4	9·0
Feb						Sept					
5	2360	90	,,	27−6, 50+6	10·0	1	2569	94	Gr	27+1	9·3
11	2366	,,	,,	41−1, 50+4	10·2	3	2571	,,	,,	27+1	9·3
16	2371	,,	,,	41−4, 50+1	10·5	4	2572	90	Bh	27+2	9·2
24	2379	45	,,	50−5, 53+5	11·1	4	2572	48	Wi	=27	9·4*b*
29	2384	90	,,	53+3	11·3	5	2573	43	Gl	27−1	9·5
Mar						5	2573	94	Gr	27+1	9·3
4	2388	45	,,	53+3	11·3	5	2573	75	Bn	27−1, =28	9·5
6	2390	,,	,,	53+1	11·5	6	2574	45	Bh	27+2	9·2
8	2392	90	,,	53+1	11·5	6	2574	48	Wi	27−2, 39+5	9·6

(7242) S AQUILÆ *continued.*

1920						1920					
Sept						Nov					
7	2575	94	Gr	=27	9·4	13	2642	45	Bh	27	9
9	2577	48	Wi	27−1	9·5	13	2642	48	Wi	33	9
10	2578	94	Gr	=27	9·4	14	2643	94	Gr	=50	10
10	2578	75	Bn	=28	9·5	16	2645	..	..	=50	10
10	2578	48	Wi	27+1	9·3	18	2647	..	..	=50	10
12	2580	..	..	27 (1) v (1) 33	9·3	18	2647	117	Gi	41	10
12	2580	90	Bh	=27	9·4	19	2648	90	Bh	27−10, 41−3	10
15	2583	94	Gr	27−1	9·5	20	2649	..	Hw	49 (5) v (5) 53	11
16	2584	48	Wi	27−2	9·6	21	2650	94	Gr	−50	10
16	2584	40	Hw	9 (6) v (4) 27	8·8	21	2650	120	Bn	49 (1) v (2) 53	10
18	2586	94	Gr	27−1	9·5	22	2651	90	Bh	41−6, 50−1	10
18	2586	48	Wi	27 (1) v (1) 41	9·7	25	2654	94	Gr	50−1	10
19	2587	..	..	=27	9·4*b*	Dec					
19	2587	50	Bn	27+1	9·3	1	2660	120	Bn	49 (3) v (1) 53	11
19	2587	90	Bh	27+1	9·3	2	2661	94	Gr	50−4, 53+6	11
21	2589	94	Gr	=27	9·4	3	2662	120	Bn	49 (3) v (1) 53	11
22	2590	90	Bh	27+2	9·2	5	2664	45	Bh	50−4	11
23	2591	94	Gr	27−0·5	9·4	6	2665	94	Gr	=50	10
25	2593	..	..	27−1	9·5	8	2667	90	Bh	50−5, 53+6	11
26	2594	90	Bh	27+2	9·2	8	2667	94	Gr	=50	10
27	2595	75	Gi	27+2·5	9·1	9	2668	120	Bn	53+1	11
27	2595	94	Gr	=27	9·4	11	2670	90	Bh	53+5	11
27	2595	40	Hw	27 (5) v (5) 44	9·9*b*	12	2671	..	..	53+3	11
29	2597	94	Gr	=27	9·4	12	2671	94	Gr	50−4, 53+6	11
29	2597	150	Bh	27+2	9·2	16	2675	90	Bh	50−3, 53+8	10
30	2598	94	Gr	27−1	9·5	17	2676	..	..	41−4, 50+1	10
Oct						17	2676	94	Gr	50−4, 53+6	11
1	2599	90	Bh	27+1	9·3	21	2680	90	Bh	41−1, 50+4	10
2	2600	48	Wi	=27	9·4	25	2684	..	..	27−5, 41+2	9
6	2604	94	Gr	=27	9·4	28	2687	75	Bn	27 (2) v (1) 43	10
8	2606	..	..	=27	9·4	28	2687	40	Hw	=30	9
8	2606	90	Bh	27+1	9·3	28	2687	48	Wi	27 (1) v (1) 41	9
11	2609	70	Bn	=27	9·4*b*	31	2690	90	Bh	27+1	9
12	2610	45	Bh	27−1	9·5*b*						
12	2610	94	Gr	=27	9·4	1921					
13	2611	48	Wi	=33	9·3*b*	Jan					
13	2611	75	Bn	28−1	9·6	2	2692	90	Bh	27+2	9
13	2611	117	Gi	=27	9·4	4	2694	75	Gi	26−1, 27+2	9
14	2612	48	Wi	27−5, 41+2	9·9*b*	6	2696	90	Bh	27+1	9
15	2613	94	Gr	=27	9·4	7	2697	,,	..	27+3	9
17	2615	90	Bh	27+1	9·3	13	2703	,,	..	27+1	9
18	2616	50	Bn	28 (2) v (1) 32	9·7	14	2704	75	Bn	27 (1) v (1) 28	9
21	2619	94	Gr	=27	9·4	15	2705	40	Hw	=27	9
22	2620	45	Bh	27−1	9·5	27	2717	90	Bh	27+5	8
23	2621	94	Gr	=27	9·4	30	2720	,,	..	27+4	9
24	2622	50	Bn	28 (2) v (1) 32, 35+3	9·7	Feb					
25	2623	90	Bh	27+1	9·3	2	2723	150	..	27+1	9
25	2623	94	Gr	=27	9·4	4	2725	47	Gi	=27	9
28	2626	..	..	=27	9·4	9	2730	45	Bh	27−1	9
28	2626	40	Hw	44	10·5*b*	17	2738	90	..	27−2	9
29	2627	50	Bn	28 (1) v (1) 32	9·7	17	2738	75	Gi	27−1, 41+4·5	9
29	2627	45	Bh	27+1	9·3	Mar					
30	2628	48	Wi	=27	9·4*b*	1	2750	117	..	27+3·5	9
Nov						6	2755	90	Bh	27+2	9
1	2630	50	Bn	35 (2) v (1) 43	10·3	11	2760	,,	..	27−1	9
1	2630	90	Bh	27−1	9·5	14	2763	50	Bn	27+1	9
1	2630	48	Wi	27 (1) v (1) 41	9·7*b*	17	2766	75	Gi	27+2·5	9
3	2632	45	Bh	27−2	9·6	23	2772	45	Bh	27−4	9
4	2633	50	Bn	35 (2) v (1) 43	10·3	26	2775	48	Wi	27−3, 39+4	9
5	2634	117	Gi	27−3, 41+6	9·5*b*	31	2780	50	Bn	30 (3) v (1) 39	10
5	2634	94	Gr	27−1	9·5	31	2780	117	Gi	27−5, 41+1	9
7	2636	..	..	27−3	9·7	Apr					
9	2638	..	..	41+1, 50+6	10·0	1	2781	90	Bh	27−5, 39+2	9
9	2638	90	Bh	27−1	9·5*b*	3	2783	75	Bn	39−0·5	10
10	2639	94	Gr	44+1	10·4	7	2787	,,	..	40 (2) v (1) 53	11
11	2640	..	..	=44	10·5	8	2788	90	Bh	39−1	10
12	2641	..	..	50+1	10·5	11	2791	117	Gi	41−3, 53+1	11
12	2641	90	Hw	=44	10·5*b*	12	2792	120	Bn	=53	11

(7242) S AQUILÆ—*continued.*

1921 Apr					
12	2792	90	Bh	53+4	11·2
19	2799	,,	,,	53+2	11·4
23	2803	,,	,,	50−2	10·8
28	2808	,,	,,	=50	10·6
28	2808	120	Bn	49 (3) v (1) 53	11·3
May					
5	2815	47	Gi	41−1, 50+2·5	10·3
9	2819	90	Bh	27−9, 50+3	10·3
15	2825	,,	,,	27−2	9·6
15	2825	50	Bn	43 (4) v (1) m	10·9
16	2826	90	Bh	27−4	9·8
24	2834	150	,,	27−5, 41+2	9·9
28	2838	48	Wi	27−7, 43+4	10·1*b*
29	2839	117	Gi	27−9, 41+2	10·1*b*
31	2841	94	Gr	50+3	10·3*b*
June					
2	2843	90	Bh	27−2	9·6
4	2845	94	Gr	=41	10·1
5	2846	90	Bh	27+2	9·2
6	2847	50	Bn	27 (1) v (2) 30	9·4
6	2847	48	Wi	27−1	9·5
8	2849	117	Gi	=27	9·4
8	2849	94	Gr	27+2	9·2
9	2850	48	Wi	27+1	9·3
10	2851	90	Bh	27+4	9·0
11	2852	48	Wi	27+3	9·1
11	2852	50	Bn	27 (1) v (3) 30	9·4
12	2853	94	Gr	27+2	9·2
15	2856	90	Bh	27+3	9·1
21	2862	117	Gi	27+2	9·2
22	2863	94	Gr	27+2	9·2
23	2864	50	Bn	27 (1) v (3) 30	9·4
24	2865	94	Gr	27+1	9·3
27	2868	90	Bh	27+3	9·1
28	2869	50	Bn	27 (1) v (1) 30	9·5
28	2869	94	Gr	=27	9·4
30	2871	,,	,,	=27	9·4
30	2871	90	Bh	27+4	9·0*b*
July					
1	2872	117	Gi	27−1·5, 41+3	9·7
2	2873	90	Bh	27+2	9·2
4	2875	,,	,,	27+2	9·2
4	2875	94	Gr	=27	9·4*b*
5	2876	50	Bn	30 (3) v (1) 39	10·0
7	2878	90	Bh	27−1	9·5
8	2879	50	Bn	39 (2) v (1) 43	10·4
9	2880	94	Gr	27−2	9·6
9	2880	48	Wi	39−3, 50+2	10·4
11	2882	90	Bh	27−4	9·8
12	2883	75	Gi	=50	10·6
12	2883	120	Bn	43+0·5	10·5
14	2885	94	Gr	=50	10·6*b*
18	2889	45	Bh	27−2	9·6
20	2891	90	,,	27−1	9·5
21	2892	94	Gr	41−3, 50+2	10·4*b*
24	2895	,,	,,	27−2	9·6
25	2896	48	Wi	27−1	9·5
26	2897	117	Gi	27−0·5	9·4
26	2897	90	Bh	27+1	9·3
26	2897	50	Bn	30 (2) v (1) 39	9·9
29	2900	94	Gr	=27	9·4
29	2900	90	Bh	27−2	9·6
31	2902	,,	,,	27−1	9·5
1921 July					
31	2902	48	Wi	=27	9·4
Aug					
2	2904	75	Bn	27 (1) v (1) 30	9·5
4	2906	94	Gr	27−2	9·6
5	2907	117	Gi	27−1·5	9·5
6	2908	45	Bh	=27	9·4
7	2909	94	Gr	27−2	9·6
8	2910	75	Bn	27 (2) v (1) 30	9·5
9	2911	94	Gr	27−2	9·6
10	2912	90	Bh	=27	9·4
15	2917	,,	,,	27−1	9·5
15	2917	117	Gi	27−2·5, 41+4	9·7
19	2921	45	Bh	27−3	9·7
21	2923	90	,,	27−3	9·7
21	2923	94	Gr	=41	10·1
25	2927	,,	,,	=50	10·6
25	2927	90	Bh	27−4	9·8
25	2927	75	Bn	=m	11·0*b*
28	2930	117	Gi	41−2, 50+1	10·4
30	2932	90	Bh	27−4	9·8
Sept					
1	2934	94	Gr	50−2	10·8
2	2935	75	Bn	m (1) v (1) 53	11·3
4	2937	90	Bh	27−7, 50+5	10·1
5	2938	,,	,,	27−8, 50+4	10·2
5	2938	75	Bn	m (2) v (1) 53	11·4
5	2938	94	Gr	50−2	10·8
5	2938	48	Wi	50−4	11·0*b*
7	2940	85	Bn	m (2) v (1) 53	11·4
7	2940	117	Gi	41−2·5, 50+1	10·4*b*
7	2940	48	Wi	50−5	11·1*b*
8	2941	,,	,,	50−1	10·7
8	2941	90	Hw	=44	10·5*b*
10	2943	48	Wi	50−6	11·2*b*
10	2943	90	Bh	27−12, 41−5	10·6*b*
15	2948	75	Bn	m (2) v (3) 53	11·2*b*
16	2949	90	Bh	27−10, 50+2	10·4
21	2954	,,	,,	41−1	10·2
21	2954	75	Bn	43 (4) v (1) m	10·9
21	2954	90	Hw	=49	10·5*b*
22	2955	48	Wi	50−4	11·0
24	2957	,,	,,	=50	10·6
24	2957	45	Bh	41+1	10·0
24	2957	117	Gi	41−1·5, 50+1	10·4*b*
24	2957	75	Bn	43 (1) v (1) m	10·8
25	2958	50	,,	43 (2) v (3) m	10·7
26	2959	94	Gr	50−2	10·8
27	2960	48	Wi	=50	10·6
27	2960	90	Hw	=44	10·5
30	2963	,,	Bh	41+1	10·0
30	2963	50	Bn	43 (3) v (1) m	10·9
Oct					
1	2964	120	,,	43 (2) v (1) m	10·8
1	2964	160	Br	41 (1) v (1) 49	10·3
1	2964	48	Wi	=50	10·6
2	2965	,,	,,	50+1	10·5
4	2967	,,	,,	39−3, 50+2	10·4
4	2967	120	Bn	43 (3) v (1) m	10·9
5	2968	94	Gr	50−2	10·8
5	2968	117	Gi	27−6, 41+1	10·0
5	2968	90	Bh	27−5, 41+2	9·9
5	2968	48	Wi	=50	10·6
6	2969	,,	,,	50+1	10·5
6	2969	90	Hw	=44	10·5
6	2969	50	Bn	43 (3) v (1) m	10·9

April 12, Bn, t.
June 12, Red.
July 14, About.

Aug. 21, Gr, About.

(7242) S AQUILÆ *continued.*

1921						1922					
Oct						Mar					
8	2971	120	Bn	43 (3) v (1) m	10·9	13	3127	...	Gi	27+2	9·2
8	2971	150	Bh	27−6, 50+6	10·0	19	3133	62	Wf	27−0·5, 30+2	9·2
8	2971	48	Wi	=50	10·6	26	3140	,,	,,	39−2, 43+1	10·2
9	2972	,,	,,	50−2	10·8	28	3142	90	Bh	27−2, 39+5	9·6
14	2977	94	Gr	=41	10·1*b*	Apr					
14	2977	120	Bn	43 (2) v (1) m	10·8	4	3149	45	,,	=39	10·1
15	2978	90	Bh	27−4, 41+3	9·8	4	3149	62	Wf	=43	10·5
18	2981	40	Hw	30 (5) v (5) 44	10·1*b*	14	3159	90	Bh	39+2, 50+7	9·9
20	2983	94	Gr	=41	10·1*b*	18	3163	,,	,,	27−4, 39+3	9·8
21	2984	117	Gi	27−4, 41+1·5	9·9	19	3164	62	Wf	27−0·5 30+2	9·2
23	2986	90	Bh	27+3	9·1	23	3168	90	Bh	27−1, 39+6	9·5
23	2986	50	Bn	43 (2) v (1) m	10·8	29	3174	,,	,,	=27	9·2
28	2991	120	,,	30 (2) v (1) 35	9·9	29	3174	62	Wf	27−1, 30+2	9·2
30	2993	94	Gr	=27	9·4	May					
31	2994	90	Bh	27+1	9·3	2	3177	90	Bh	27+2	9·2
Nov						6	3181	,,	,,	27+4	9·0
6	3000	50	Bn	30 (1) v (2) 39	9·8	6	3181	50	Bn	27+2	9·2
7	3001	90	Bh	27+2	9·2*b*	6	3181	120	Wi	27+1	9·3
8	3002	160	Br	27−1	9·5	8	3183	90	Bh	27+4	9·0
8	3002	50	Bn	30 (5) v (2) 39	10·0	14	3189	62	Wf	13−7, 27+3	9·1
10	3004	,,	,,	30 (3) v (1) 39	10·0	17	3192	90	Bh	27+2	9·2
10	3004	90	Hw	v (8) 44 (2) 49	10·3*b*	17	3192	...	Gi	27+0·5	9·3
12	3006	,,	Bh	27−1	9·5	21	3196	62	Wf	27−2, 30+3	9·2
17	3011	94	Gr	41−5	10·6	21	3196	50	Bn	27 (1) v (2) 30	9·4
17	3011	117	Gi	=41, 50+1·5	10·3	26	3201	90	Bh	27−2	9·6
20	3014	90	Bh	=41	10·1	27	3202	50	Bn	=30	9·6
22	3016	,,	,,	41−3, 50+2	10·4	28	3203	90	Wi	27−8, 50+1	10·3
23	3017	,,	Hw	=49	10·5*b*	28	3203	...	Gi	27 (4) v (2·5) 41	9·8
23	3017	120	Bn	m (2) v (1) 53	11·4	28	3203	90	Bh	=27	9·4
24	3018	90	Bh	50−3	10·9	29	3204	62	Wf	27−1, 30+1	9·5
25	3019	,,	,,	50−4	11·0	June					
26	3020	,,	,,	=50	10·6	1	3207	50	Bn	30−1	9·7
27	3021	120	Bn	m (4) v (1) 53	11·5	4	3210	90	Bh	=27	9·4
28	3022	117	Gi	50−2, 53+3·5	11·0*b*	12	3218	,,	,,	=27	9·4
30	3024	94	Gr	50−5	11·1	14	3220	62	Wf	30−5, 44+3	10·2
Dec						16	3222	...	Gi	27 (3) v (1·5) 41	9·9
3	3027	45	Bh	=50	10·6	19	3225	90	Bh	27−2	9·6
8	3034	117	Gi	27−4, 50+4·5	9·9	22	3228	,,	Gr	=50	10·6
13	3037	62	Wf	27−1, 30+2	9·4	24	3230	,,	,,	=50	10·6
13	3037	45	Bh	27−6, 41+1	10·0*b*	24	3230	62	Wf	30−3, 50+5	10·6
15	3039	90	,,	27−5, 41+2	9·9*b*	26	3232	90	Bh	27−8, 39+1, 50+4	10·1
17	3041	48	Wi	27−4, 39+3	9·8	27	3233	,,	Gr	=50	10·6
17	3041	40	Hw	27 (3) v (7) 44	9·7*b*	28	3234	...	Gi	=41, 50+2·5	10·2
21	3045	90	Bh	27−1	9·5	29	3235	45	Bh	39−3, 50+2	10·3
21	3045	94	Gr	=41	10·1	July					
22	3046	50	Bn	30 (2) v (1) 39	9·9	1	3237	90	Gr	=50	10·6
23	3047	90	Bh	=27	9·4	2	3238	45	Bh	=39	10·1
25	3049	,,	,,	=27	9·4	9	3245	90	Gr	41−3, 50+2	10·2
25	3049	75	Bn	30 (1) v (1) 39	9·9	10	3246	...	Gi	27 (4·5) v (2·5) 41	9·8
27	3051	94	Gr	=41	10·1	10	3246	90	Bh	27−1	9·5
28	3052	75	Bn	30 (2) v (3) 39	9·8	14	3250	,,	,,	=27	9·2
29	3053	90	Bh	27−1	9·5	16	3252	,,	Gr	=50	10·6
30	3054	75	Gi	27−2·5, 41+6	9·6	19	3255	75	Bn	43+1	10·2
31	3055	,,	Bn	30 (3) v (2) 39	9·9	20	3256	90	Gr	=50	10·6
1922						20	3256	45	Bh	27−5, 39+2	9·6
Jan						22	3258	...	Gi	27 (3·5) v (2) 41	9·8
1	3056	90	Bh	27−4, 39+3	9·8*b*	23	3259	62	Wf	27−5, 30−2, 44+1	10·6
2	3057	75	Bn	30 (1) v (1) 39	9·9	23	3259	45	Bh	27−6	10·6
8	3063	90	Bh	=39	10·1*b*	25	3261	90	Gr	50−2	10·8
9	3064	62	Wf	43 (1) v (3) 49	10·5*b*	27	3263	45	Bh	27−8, 39−1, 50+4	10·2
17	3072	,,	,,	27−7, 30−6, 44+4	10·1*b*	30	3266	90	Gr	50−5	11·1
18	3073	90	Bh	27−5, 39+2	9·9	30	3266	150	Wf	50−4, 53−2	11·1
Feb						31	3267	45	Bh	39−8, 50−3	10·6
17	3103	,,	,,	39−8, 50−3	10·9*b*	Aug					
27	3113	62	Wf	=43, 44+2	10·4	1	3268	...	Gi	50 (3) v (2·5) 53	11·1
28	3114	...	Gi	27 (2) v (6) 41	9·5	5	3272	90	Bh	50−6, 53+5	11·1
Mar						7	3274	75	Bn	[illegible] m	11·0
4	3118	90	Bh	39−6, 50−1	10·7	9	3276	90	Gr	50−7	11·1

(7242) S AQUILÆ—*continued.*

1922 Aug					
12	3279	45	Bh	50−7, 53+4	11·2
12	3279	...	Gi	50 (3·5) v (1) 53	11·4
15	3282	90	Gr	50−5	11·1*b*
16	3283	62	Wf	44−5, 53+3	11·1*b*
17	3284	90	Bh	27−10, 50+2	10·4
18	3285	,,	,,	27−8	10·2
20	3287	,,	,,	27−8	10·2
20	3287	,,	Gr	50−5	11·1*b*
21	3288	62	Wf	30−4, =44	10·3
22	3289	...	Gi	=41, 50+2	10·2
23	3290	75	Bn	43−4, m+0·5	10·9
23	3290	90	Bh	27−6, 39+1	10·0
23	3290	60	Kw	41+1, =43	10·3
24	3291	90	Gr	50−3	10·9
25	3292	160	Br	41−1	10·2
25	3292	90	Bh	27−3	9·7
26	3293	62	Wf	27−4, 30−1, 44+5	9·8*b*
26	3293	44	Wi	27−5	9·9
29	3296	90	Bh	27−2	9·6
31	3298	,,	,,	27−1	9·5
Sept					
7	3305	,,	,,	=27	9·4
7	3305	62	Wf	27−2, 30+1	9·5
8	3306	96	Gr	27−3	9·7
9	3307	75	Bn	27 (2) v (1) 30	9·5
11	3309	62	Wf	27−3, =30	9·6
11	3309	120	Wi	27+1	9·3
13	3311	,,	,,	=27	9·4
13	3311	60	Kw	30 (1) v (4) 39, 30−1	9·7
14	3312	150	Wf	27−4, 44+5	9·9
15	3313	75	Bn	30 (2) v (1) 39	9·9
15	3313	90	Bh	=27	9·4
15	3313	60	Kw	30−1	9·7*b*
16	3314	62	Wf	27−3, =30	9·6
16	3314	96	Gr	27−2	9·6
17	3315	...	Gi	27 (3) v (4) 41	9·7
18	3316	45	Bh	27+1	9·3
18	3316	60	Kw	27 (1) v (2) 30, 30+1	9·5*b*
19	3317	62	Wf	27−3, =30	9·6
20	3318	90	Hw	27 (5) v (5) 44	9·9
20	3318	60	Kw	21 (4) v (1) 30, =27, 30+2	9·4
20	3318	96	Gr	27−2	9·6
20	3318	50	Bn	30 (1) v (1) 39	9·9
21	3319	90	Bh	27+2	9·2
23	3321	62	Wf	27−3, =30	9·6
24	3322	60	Kw	27 (2) v (1) 30, 27−1	9·5*b*
26	3324	,,	,,	27 (1) v (4) 30, 27−1	9·4*b*
26	3324	90	Bh	27+2	9·2
29	3327	96	Gr	27−1	9·5
30	3328	90	Bh	=27	9·4
Oct					
4	3332	,,	,,	27+2	9·2
5	3333	62	Wf	27+1	9·3*b*
7	3335	31	Li	=27	9·4
7	3335	40	Hw	=30	9·6
7	3335	90	Bh	=27	9·4
11	3339	60	Kw	27+2	9·2*b*
12	3340	96	Gr	27−1	9·5
12	3340	31	Li	=27	9·4
13	3341	90	Bh	=27	9·4
13	3341	50	Bn	27 (2) v (1) 30	9·5
13	3341	60	Kw	=27	9·4*b*
13	3341	120	Wi	27+2	9·2
14	3342	,,	,,	27+1	9·3
14	3342	150	Wf	=27	9·4
14	3342	90	Bh	=27	9·4
14	3342	60	Kw	27+1	9·3*b*
1922 Oct					
15	3343	50	Bn	27 (1) v (1) 30	9·5
15	3343	31	Li	21 (9) v (1) 27	9·3
16	3344	90	Hw	=30	9·6*b*
16	3344	96	Gr	27−1	9·5
16	3344	60	Kw	27+1	9·3*c*
16	3344	31	Li	=27	9·4
18	3346	,,	,,	=27	9·4
21	3349	45	Bh	27−1	9·5*b*
21	3349	...	Gi	27+2	9·2
22	3350	60	Kw	27−2	9·6*c*
22	3350	50	Bn	27 (2) v (1) 30	9·5
25	3353	90	Bh	27+1	9·3
28	3356	45	,,	27+1	9·3*b*
28	3356	31	Li	=27	9·4
28	3356	90	Hw	=30	9·6
Nov					
1	3360	62	Wf	=27	9·4
1	3360	31	Li	=27	9·4
1	3360	96	Gr	=27	9·4
1	3360	90	Bh	27+2	9·2
4	3363	60	Kw	27−1	9·5*c*
10	3369	96	Gr	27−1	9·5
11	3370	157	Wf	=27	9·4
13	3372	45	Bh	27−1	9·5*b*
13	3372	50	Bn	30 (3) v (1) 43	10·3
15	3374	,,	,,	43+3	10·2
15	3374	90	Hw	=30	9·6*b*
16	3375	96	Gr	27−1	9·5
18	3377	45	Bh	27−3	9·7*b*
24	3383	90	,,	27−5, 39+2	9·9
25	3384	...	Gi	27 (4) v (1·5) 41	9·9
28	3387	90	Bh	39−1	10·2*b*
Dec					
1	3390	,,	,,	39−3, 50+2	10·4
6	3395	,,	,,	39−7, 50−2	10·8
11	3400	,,	,,	50−8, 53+3	11·3
11	3400	...	Gi	50 (4) v (1·5) 53	11·3
16	3405	90	Bh	50−8, 53+3	11·3*b*
17	3406	,,	,,	50−6, 53+5	11·1
18	3407	,,	,,	50−8, 53+3	11·3
19	3408	120	Bn	53−1	11·7
25	3414	90	Bh	=50	10·6*b*
26	3415	40	Hw	<44	<10·5
26	3415	85	Bn	53−1	11·7
1923 Jan					
4	3424	90	Bh	27−10, 50+2	10·4
8	3428	,,	,,	=50	10·6*b*
8	3428	120	Bn	m (3) v (1) 53	11·5
10	3430	75	,,	43−4, m+1	10·9
14	3434	,,	,,	43 (1) v (1) m	10·8
20	3440	150	Wf	27+1	9·3*b*
24	3444	,,	,,	27−3	9·7*b*
24	3444	45	Bh	=27	9·4*b*
Feb					
4	3455	,,	,,	27+4	9·0
9	3460	,,	,,	27+4	9·0*b*
Mar					
2	3481	90	Bh	27+4	9·0
13	3492	,,	,,	27+2	9·2
24	3503	117	Gi	27+1·5	9·2
25	3504	90	Bh	27+1	9·3
Apr					
3	3513	117	Gi	27 (4·5) v (3) 41	9·8

Jan. 8, Bn, t.

(7242) S AQUILÆ—*continued.*

1923					
Apr					
9	3519	150	Wf	27−5, 30−2, 49+5	9·9
9	3519	90	Bh	27−6, 50+6	10·0
14	3524	,,	,,	50+2	10·4
15	3525	150	Wf	=50	10·6
17	3527	90	Bh	=50	10·6
23	3533	62	Wf	50−7·5, 53+2	11·4
25	3535	117	Gi	53−2	11·8
May					
1	3541	90	Bh	50−10, 53+1	11·5*b*
9	3549	,,	,,	50−9, 53+2	11·4
19	3559	117	Gi	53−1	11·7
21	3561	150	Wf	50−5, 53+4	11·1
30	3570	90	Bh	27−4, 41+3	9·8
June					
2	3573	,,	,,	27−1	9·5
5	3576	62	Wf	27−3, =30	9·6
9	3580	,,	,,	27−1, 30+2	9·4
11	3582	117	Gi	27−3·5	9·7*b*
11	3582	90	Bh	=27	9·4
21	3592	45	,,	27+2	9·2
23	3594	90	,,	=27	9·4
28	3599	62	Wf	27−2, 30+2	9·5
30	3601	117	Gi	27−0·5	9·4
30	3601	90	Bh	27+2	9·2
July					
2	3603	...	Gr	27+2	9·2
4	3605	62	Wf	13−6, 27+2	9·1
5	3606	90	Bh	27+2	9·2
8	3609	,,	,,	27+3	9·1
8	3609	...	Gr	27+5	8·9
10	3611	62	Wf	13−6, 27+3	9·1
13	3614	,,	,,	13−7, 27+2	9·2
17	3618	117	Gi	25 (1·5) v (3) 27	9·1
19	3620	...	Gr	27+6	8·8
20	3621	90	Bh	27+5	8·9
21	3622	34	Li	21 (3) v (7) 27	8·8
25	3626	62	Wf	13−5, 27+4	9·0
28	3629	34	Li	21 (4) v (6) 27	8·9
29	3630	...	Gr	13−3, 27+6	8·8
30	3631	90	Bh	27+4	9·0
Aug					
3	3635	,,	,,	27+5	8·9
4	3636	,,	,,	27+4	9·0
4	3636	50	Bn	27+1	9·3
5	3637	62	Wf	=27	9·4
8	3640	50	Bn	27 (1) v (2) 30	9·4
8	3640	90	Bh	27+2	9·2
9	3641	,,	,,	27+1	9·3
11	3643	,,	,,	27+1	9·3
11	3643	50	Bn	27 (2) v (1) 30	9·6
12	3644	62	Wf	27−2, 30+1	9·5
13	3645	50	Bn	27 (3) v (1) 30	9·6
14	3646	90	Bh	27+1	9·3
15	3647	62	Wf	27−3, =30	9·6
18	3650	90	Bh	27−1	9·5
22	3654	,,	,,	27−3, 41+4	9·7
26	3658	,,	,,	27−5	9·9
28	3660	,,	,,	27−8, 50+4	10·2
29	3661	...	Gr	41+1	10·0
29	3661	150	Wf	50−5, 53+4	11·1
30	3662	50	Bn	m (4) v (1) 53	11·5
30	3662	90	Bh	27−10, 50+2	10·4*b*
31	3663	,,	,,	50−5, 53+8	10·9
Sept					
2	3665	,,	,,	53+3	11·3

1923					
Sept					
3	3666	150	Wf	50−8, 53+2	11·
4	3667	90	Bh	53+1	11·
5	3668	120	Bn	53+1	11·
7	3670	90	Bh	53+1	11·
8	3671	,,	,,	=53	11·
8	3671	120	Bn	53−2	11·
8	3671	157	Wf	=53	11·
10	3673	90	Bh	53−1	11·
11	3674	,,	,,	53−2	11·
12	3675	150	Wf	53−4	12·
15	3678	120	Bn	53−2	11·
16	3679	90	Bh	53−2	11·
16	3679	120	Wi	53−1	11·
17	3680	,,	,,	53−2	11·
21	3684	50	Bn	53−2	11·
21	3684	90	Bh	53−1	11·
21	3684	120	Wi	53−1	11·
22	3685	90	Bh	=53	11·
22	3685	150	Wf	53−3	11·
26	3689	90	Bh	53+1	11·
29	3692	120	Bn	53−2	11·
29	3692	...	Gr	53−2	11·
29	3692	157	Wf	53−1·5	11·
30	3693	120	Wi	53−1	11·
30	3693	90	Bh	53+1	11·
Oct					
1	3694	,,	,,	53+1	11·
4	3697	,,	,,	53+1	11·
4	3697	120	Bn	53−2	11·
8	3701	157	Wf	53−3	11·
9	3702	90	Bh	=53	11·
10	3703	...	Gr	=53	11·
11	3704	90	Bh	53+2	11·
14	3707	120	Bn	53−1	11·
15	3708	90	Hw	=53	11·
17	3710	,,	Bh	53+5	11·
19	3712	,,	,,	50−7, 53+4	11·
20	3713	,,	,,	53+5	11·
22	3715	120	Bn	53+1	11·
23	3716	90	Bh	41−5, 50−1	10·
25	3718	,,	,,	41−3, 50+2	10·
25	3718	120	Wi	53+4	11·
26	3719	90	Hw	=53	11·
27	3720	150	Wf	50−6, 53+3	11·
28	3721	120	Bn	m (1) v (1) 53	11·
30	3723	...	Gr	=50	10·
31	3724	157	Wf	50 (4) v (2) 52	11·
Nov					
1	3725	90	Bh	50−1	10·
2	3726	120	Wi	50−5, 53+6	11·
3	3727	,,	,,	53−1	11·
3	3727	,,	Bn	m (3) v (1) 53	11·
3	3727	90	Bh	41−4, 50+1	10·
7	3731	,,	,,	27−10, 41−3	10·
7	3731	50	Bn	m+1	10·
10	3734	,,	,,	m (3) v (2) 53	11·
10	3734	90	Bh	=50	10·
10	3734	40	Hw	=53	11·
14	3738	120	Wi	50−4, 53+7	10·
14	3738	50	Bn	m (1) v (2) 53	11·
16	3740	90	Bh	27−5, 41+2	9·
17	3741	50	Bn	43 (4) v (1) m	10·
23	3747	90	Bh	27−2	9·
30	3754	,,	,,	27+2	9·
30	3754	50	Bn	27−1, 30+2	9·

Aug. 14, Unsteady.

Oct. 10, About.

(7242) S AQUILÆ—*continued.*

23					1924					
ov					May					
o	3754	62	Wf	27−0·5, 30+2	9·4	27	3933	60	D	30 (4) v (1) 43	10·3
ec						27	3933	50	Bn	30 (3) v (1) 43	10·3
2	3756	50	Bn	=27	9·4	28	3934	62	Wf	30−4, 50+4	10·1
4	3758	,,	,,	27+1	9·3	June					
4	3758	90	Bh	27+2	9·2	1	3938	,,	,,	30−6, 50+3	10·3
5	3760	,,	,,	27+4	9·0	13	3950	90	Bh	27−5	9·9
8	3762	,,	,,	27+8	8·6	18	3955	,,	,,	35−2	10·2
9	3763	,,	,,	27+6	8·8	20	3957	50	Bn	30 (3) v (1) 35	9·9
1	3765	150	Wf	13 (8) v (2) 27, 27+3	9·1*b*	23	3960	100	Lp	27 (2) v (1) 50	10·2*b*
2	3766	90	Bh	27+6	8·8	23	3960	60	Si	=50	10·6*b*
5	3769	50	Bn	27 (2) v (1) 30	9·5	23	3960	62	Wf	30−4, 50+4	10·1
8	3772	,,	,,	27 (1) v (2) 30	9·4	24	3961	90	Bh	=43	10·5
8	3772	90	Bh	27+5	8·9	25	3962	60	Si	=50	10·6
9	3773	,,	,,	27+4	9·0	27	3964	62	Wf	30−6, 50+4	10·2
2	3776	,,	,,	27+4	9·0	27	3964	90	Bh	27−5	9·9
3	3777	50	Bn	27 (1) v (1) 30	9·5	30	3967	,,	,,	=35	10·0
4	3778	90	Bh	27+3	9·1	30	3967	100	Lp	=49	10·5*b*
8	3782	,,	,,	27+3	9·1	July					
24						1	3968	60	D	41−1, 43+3	10·2
n						2	3969	90	Bh	27−5	10·0
1	3786	45	,,	27−1	9·5	3	3970	62	Wf	30−7, 50+3	10·3
3	3788	,,	,,	27−3	9·7	4	3971	90	Bh	27−7, 35−1	10·1
5	3791	33	Wi	27−6, 39+1	10·0*b*	6	3973	60	D	41−1	10·2
5	3791	50	Bn	30 (3) v (1) 39	10·0	7	3974	62	Wf	30−6, 50+4	10·2
9	3804	150	Wf	30−5, 50+2	10·3	9	3976	90	Bh	27−5	9·9
5	3811	90	Bh	=50	10·6*b*	9	3976	60	D	41−1, 50+2	10·3
b						11	3978	50	Bn	43 (4) v (1) m	10·9
1	3817	,,	,,	=50	10·6*b*	13	3980	,,	,,	43 (3) v (1) m	10·9
1	3827	,,	,,	=50	10·6	13	3980	100	Lp	44 (2) v (2) 50	10·5*b*
4	3830	,,	,,	27−10, 50+2	10·4	19	3986	120	Bn	35 (4) v (1) 43	10·4
4	3830	50	Bn	43 (4) v (1) m	10·9	19	3986	90	Bh	27−5	9·9
9	3832	,,	,,	43 (3) v (1) m	10·9	22	3989	62	Wf	30−3, 50+5	10·0
2	3838	90	Bh	50−2	10·8	24	3991	50	Bn	35 (2) v (1) 43	10·3
7	3843	45	,,	41−6, 50−1	10·7	24	3991	100	Lp	27 (2) v (2) 50, =30	9·9*b*
r						24	3991	90	Bh	27−6	10·0
2	3847	90	,,	50−3	10·9	27	3994	62	Wf	30−5, 50+4	10·2
4	3849	50	Bn	m (1) v (2) 53	11·2	29	3996	50	Bn	35 (3) v (1) 43	10·4
8	3853	,,	,,	m (1) v (2) 53	11·2	29	3996	90	Bh	=35	10·0
0	3855	90	Bh	41−2, 50+3	10·3	31	3998	60	D	27−3, 41+2	9·8
3	3858	50	Bn	43 (2) v (1) m	10·8	Aug					
.	3859	90	Bh	27−6, 50+6	10·0	1	3999	62	Wf	30−5, 50+5	10·1
9	3864	45	,,	27−3, 41+4	9·7	2	4000	50	Bn	35 (2) v (1) 43	10·3
5	3871	90	,,	27−1	9·5	2	4000	90	Bh	27−4	9·8
9	3874	,,	,,	=27	9·4	5	4003	100	Lp	30 (2) v (2) 43	10·1
r						5	4003	60	Si	=27	9·4
1	3877	50	Bn	27 (4) v (1) 30	9·6	5	4003	50	Bn	30 (2) v (1) 35	9·9
1	3877	90	Bh	27−1	9·5	6	4004	62	Wf	30−3, 50+6	10·0
3	3879	,,	,,	27−1	9·5	7	4005	50	Bn	30 (2) v (1) 35	9·9
4	3880	50	Bn	30 (3) v (1) 39	10·0	8	4006	90	Bh	27−2	9·6
5	3882	90	Bh	=27	9·4	8	4006	100	St	27 (1) v (4) 50, 27−2	9·6
9	3885	50	Bn	43 (1) v (1) m	10·8	9	4007	,,	,,	27−1	9·5
1	3887	90	Bh	27−2	9·6	10	4008	62	Wf	27−4, 30−1	9·7
4	3890	,,	,,	27−1	9·5*b*	10	4008	60	Si	=27	9·4
0	3896	,,	,,	27+1	9·3*b*	12	4010	50	Bn	27 (3) v (1) 30	9·6
4	3900	62	Wf	27−4, 30−1	9·7	15	4013	90	Bh	27−2	9·6
5	3901	90	Bh	27+2	9·2	18	4016	100	St	27−1	9·5
y						19	4017	50	Bn	27 (3) v (1) 30	9·6
3	3909	,,	,,	=27	9·4	19	4017	80	Wi	27−2, 39+5	9·6
5	3911	50	Bn	27 (3) v (1) 30	9·6	19	4017	90	Bh	27−1	9·5
5	3912	90	Bh	=27	9·4	19	4017	60	Kw	27+1	9·3
7	3913	62	Wf	27−2, =30	9·6	20	4018	62	Wf	27−3	9·7*b*
1	3917	157	,,	27−2	9·6	24	4022	50	Bn	27 (2) v (1) 30	9·5
3	3919	90	Bh	27−1	9·5	24	4022	100	St	27−1	9·5
5	3922	45	,,	27−2	9·6	25	4023	90	Bh	27−2	9·6
5	3922	50	Bn	27 (2) v (1) 30	9·5	26	4024	157	Wf	27−1	9·5
2	3928	90	Bh	27−1	9·5	27	4025	60	D	27−1	9·5
5	3931	62	Wf	27−5, 30−2	9·8	29	4027	100	St	27−1·5	9·5
5	3932	90	Bh	27−2	9·6	31	4029	62	Wf	27−0.5	9·4

(7242) S AQUILÆ—*continued.*

1924						1924					
Aug						Oct					
31	4029	100	Lp	27 (4) v (1) 30	9·6	24	4083	100	Si	=30	9
31	4029	75	Bn	30 (3) v (2) 35	9·9	27	4086	90	Bh	27+2	9
Sept						28	4087	100	Si	=27	9
2	4031	90	Bh	27+1	9·3	31	4090	90	Bh	27+2	9
4	4033	,,	,,	27+1	9·3	Nov					
7	4036	62	Wf	27−4, 30−1	9·7	2	4092	100	Si	=27	9
8	4037	50	Bn	30 (4) v (1) 35	9·9	3	4093	90	Bh	27+2	9
8	4037	40	Hw	27 (5) v (5) 30	9·5	4	4094	34	Li	27 (3) v (7) 30	9
8	4037	90	Bh	27+2	9·2	4	4094	100	St	27 (1) v (9) 50, 27−1·5	9
14	4043	45	,,	27+3	9·1	4	4094	40	Hw	=30	9
17	4046	90	,,	27+4	9·0	5	4095	90	Bh	27+1	9
19	4048	60	D	27+1	9·3	6	4096	34	Li	27 (3) v (7) 30	9
22	4051	,,	,,	=27	9·4	8	4098	86	Ha	=30	9
22	4051	,,	Si	21 (3) v (2) 27	9·0	8	4098	90	Bh	27−2	9
22	4051	90	Hw	=30	9·6	10	4100	120	Bn	30 (3) v (1) 35	9
22	4051	50	Bn	27 (2) v (3) 30	9·5	10	4100	60	Kw	27−2	9
23	4052	60	Kw	27+2	9·2	12	4102	34	Li	27 (3) v (7) 30	9
23	4052	100	Lp	=27	9·4	13	4103	45	Bh	27−3	9
24	4053	45	Bh	27+5	8·9*b*	15	4105	90	,,	27−5	9
26	4055	60	D	=27	9·4	17	4107	34	Li	27 (5) v (5) 30	9
26	4055	150	Wf	=27	9·4	17	4107	100	St	27 (1) v (3) 50	9
27	4056	50	Bn	27+1	9·3	17	4107	,,	Si	=50	10
27	4056	90	Bh	27+5	8·9	17	4107	50	Bn	35 (3) v (1) 43	10
28	4057	100	Lp	=27	9·4*b*	19	4109	45	Bh	27−5, 30+2	9
30	4059	60	Si	21 (3) v (2) 27	9·0	24	4114	90	,,	27−4	9
30	4059	90	Bh	27+5	8·9	27	4117	40	Hw	=49	10
Oct						27	4117	50	Bn	43 (3) v (1) m	10
2	4061	,,	,,	27+5	8·9	27	4117	60	Kw	27−2	9
3	4062	100	Lp	=27	9·4*b*	28	4118	90	Bh	27−4	9
5	4064	,,	St.	27−0·5	9·4	28	4118	100	St	27 (2) v (1) 50	10
5	4064	62	Wf	27+2, 30+5	9·1	30	4120	75	Lp	43−1	10
8	4067	100	Si	13 (3) v (2) 27	9·0*b*	30	4120	100	Si	=50	10
11	4070	90	Bh	27+3	9·1	Dec					
12	4071	50	Bn	23 (2) v (1) 27	9·2	5	4125	120	Bn	43 (4) v (1) m	10
13	4072	68	Ha	13 (4) v (1) 27	9·2	6	4126	94	Li	=50	10
13	4072	40	Hw	=30	9·6*b*	10	4130	193	,,	=50	10
13	4072	100	Si	21 (3) v (2) 27	9·0	10	4130	86	Ha	35 (2) v (3) 43	10
13	4072	90	Bh	27+3	9·1	14	4134	50	Bn	43 (4) v (1) m	10
16	4075	150	Wf	27+1·5	9·2	14	4134	90	Bh	27−4	9
20	4079	100	St	27−0·5	9·4	17	4137	86	Ha	35 (4) v (1) 43	10
22	4081	,,	,,	27−0·5	9·4	17	4137	90	Hw	=30	9
23	4082	90	Bh	27+2	9·2	19	4139	,,	Bh	27 (2) v (1) 35	9
23	4082	100	Lp	27 (1) v (2) 30	9·4	22	4142	,,	,,	27−6, 30−4, 35−3	10
23	4082	40	Hw	=27	9·4	22	4142	100	Si	=50	10
23	4082	68	Ha	=27	9·4	25	4145	45	Bh	30 (1) v (1) 35	9
23	4082	120	Bn	27+1	9·3	28	4148	86	Ha	35 (3) v (2) 43	10

(782) R ARIETIS. (V. 1.)

H.D. 021024.

Star P = B.D. + 24° 325, 7m·08, **H.A., 45,** 35.
„ R = „ + 24° 335, 7·86, estimated.
„ T = „ + 23° 308, 7·7, estimated by Nijland.

Date.	Julian Date.	Inst.	Observer.	Comparisons.	Deduced Mag.
1920 Jan					
1	2325	150	Tn	16+2	11·7*b*
4	2328	„	„	=16	11·9*b*
8	2332	75	Bg	16−1, 18+3	12·0
9	2333	55	Bo	=18	12·3*b*
9	2333	94	Ni	14 (6) v (1·5) 16	11·7
14	2338	55	Bo	=17	12·3
15	2339	160	Br	18−4, 20+4	12·8
15	2339	150	Tn	18+2	12·1
16	2340	75	Bg	16−3, 18+1	12·2
19	2343	120	Bn	18 (1) v (1) 19	12·6*b*
19	2343	79	Ma	18+2	12·1
21	2345	55	Bo	16 (3) v (1) 18	12·2
21	2345	120	Bn	18 (3) v (2) 19	12·6
24	2348	79	Ma	=18, =19, =20	12·8
24	2348	75	Bg	18−2, 19+2·5	12·5
26	2350	120	Br	18−2, 19+2	12·6
30	2354	150	Tn	18+2	12·1
Feb					
2	2357	55	Bo	=15	11·3
3	2358	94	Ni	14 (4) v (3) 16	11·6
6	2361	75	Bg	14−3·5, 16+3·5	11·5*b*
6	2361	160	Br	16−2, 18+3	12·1
6	2361	183	Ma	18+3, 19+5	12·2*b*
6	2361	94	Ni	14 (2·5) v (3) 16	11·5
8	2363	79	Ma	18+5	11·8
8	2363	150	Tn	=15	11·3
8	2363	120	Bn	13 (2) v (1) 15	11·1
11	2366	95	„	13 (2) v (1) 15	11·1
12	2367	55	Bo	15 (1) v (3) 16	11·4
15	2370	„	„	14 (1) v (1) 15	11·2
15	2370	94	Ni	10 (2) v (5) 14	10·5*b*
15	2370	60	Tn	=12	10·5
17	2372	55	Bg	11−2, 14+2	11·0
17	2372	95	Bn	13 (1) v (2) 15	10·9
17	2372	60	D	9−7, 11+1	10·7
18	2373	94	Ni	10 (1) v (4) 14	10·4*b*
19	2374	55	Bo	9 (3) v (1) 10	10·2
20	2375	60	Tn	12+2	10·3*b*
21	2376	„	„	11+2	10·6
21	2376	45	Br	9−8, 14+3	10·9
21	2376	79	Ma	=10	10·3
22	2377	55	Bo	9 (1) v (1) 10	10·2
22	2377	60	D	9−4, 11+3	10·5
22	2377	94	Ni	7 (5) v (4) 10	10·0
24	2379	55	Bg	9−2, 11+5	10·3*b*
28	2383	23	Bo	9 (1) v (3) 10	10·1
Mar					
1	2385	94	Ni	7+1	9·5
2	2386	60	Tn	=6	9·6
3	2387	55	Bo	5 (1) v (3) 6	9·5
7	2391	50	Bn	5 (1) v (1) 6	9·5
7	2391	60	Tn	5 (5) v (1) 6	9·5
8	2392	23	Bo	4 (3) v (1) 5	9·2
10	2394	60	Tn	5 (5) v (5) 6	9·5*b*
11	2395	„	„	4−2	8·9
12	2396	23	Bo	4 (1) v (1) 5	9·1
13	2397	60	Tn	4 (2) v (8) 5	8·9
15	2399	„	„	4−1	8·8
15	2399	30	D	4+1	8·6
16	2400	23	Bo	4 (1) v (3) 5	8·9
17	2401	60	Tn	=4	8·7
18	2402	45	Br	4 3, 5+3	9·1
18	2402	50	Bn	4 (1) v (2) 5	8·9
19	2403	23	Bo	P (9) v (1) 4	8·5
19	2403	30	D	4+3	8·4*b*
20	2404	50	Bn	4−1	8·8
22	2406	30	Tn	4+3	8·4*b*
Apr					
1	2416	22	Ni	P (4) v (1·5) T	7·5
July					
8	2514	94	„	...	<12·1
14	2520	„	„	20 (3) v (1) 28	13·5
16	2522	„	„	20 (4) v (1) 28	13·5
17	2523	120	Br	19−5	13·3*b*
19	2525	94	Ni	20 (5) v (1) 28	13·0
24	2530	„	„	=28	13·6*b*
27	2533	„	„	20 (5) v (1) 28	13·6
Aug					
4	2541	„	„	20 (3) v (2) 28	13·5*b*
19	2556	120	Bn	<11	10·8
26	2563	75	„	13 (1) v (1) 15	11·0
Sept					
5	2573	„	„	9 (2) v (1) 11	10·5
6	2574	94	Ni	7 (2) v (5) 10	9·8
6	2574	60	Tn	9 (5) v (5) 11	10·4
8	2576	„	„	9 (2) v (8) 11	10·2
8	2576	55	Bo	7 (1) v (2) 10	9·8
8	2576	30	D	=9	10·1
9	2577	94	Ni	7 (4) v (4) 10	9·9
10	2578	30	D	8−2, 9+1	10·0
12	2580	75	Bn	9 (4) v (1) 12	10·4
13	2581	60	Tn	9 (2) v (8) 11	10·2
14	2582	94	Ni	7−0·5	9·7
14	2582	55	Bo	9 (1) v (3) 10	10·1
15	2583	30	Tn	9	10·1
18	2586	55	Bg	6−4, 9+1	10·0*b*
18	2586	50	Bn	6 (3) v (2) 9	9·9
19	2587	55	Bo	4 (7) v (1) 5	9·3

Jan. 19, Bn, t.
Feb. 22, Ni, With 22, 10·1.

Mar. 17, 12½-in. spec.
July 17, About. Difficult.
Aug. 19, t, Not seen.
Sept. 14, Ni, With 22, 9·7.

(782) R ARIETIS—*continued.*

1920 Sept					
19	2587	45	Br	6+1, 9+5	9·5
19	2587	30	D	4−6, 5+0·5	9·3
19	2587	22	Ni	5 (4) v (1·5) 7	9·5
19	2587	30	Tn	=9	10·1
21	2589	,,	,,	5 (5) v (5) 9, =7	9·7
24	2592	,,	,,	4 (5) v (5) 5	9·1*b*
30	2598	,,	,,	7+5	9·1*c*
Oct					
3	2601	,,	D	4−4, 5+3	9·1*b*
4	2602	23	Bo	4 (1) v (3) 5	8·9
4	2602	22	Ni	4 (5) v (2·5) 5	9·2
5	2603	30	D	4−2, 5+5	8·9
6	2604	55	Bg	=5, 6+2	9·4
6	2604	45	Br	4−3, 5+3	9·1
6	2604	50	Bn	4 (1) v (2) 5	8·9
8	2606	30	D	4−2, 5+6	8·9
8	2606	22	Ni	4 (4·5) v (2·5) 5	9·2
9	2607	23	Bo	=4	8·7
11	2609	30	D	e−4, 4+1	8·6
11	2609	55	Bg	4−6, 5+1	9·3*b*
11	2609	22	Ni	4 (3·5) v (3·5) 5	9·1
11	2609	50	Bn	4 (2) v (1) 5	9·2
12	2610	117	Gi	5+6	8·8*b*
12	2610	30	Tn	=4, 7+6	8·9
14	2612	23	Bo	P (9) v (1) 4	8·5
18	2616	50	Bn	4 (2) v (1) 5	9·2
18	2616	30	D	e−2, 4+2	8·5
19	2617	23	Bo	P (4) v (1) 4	8·4
19	2617	55	Bg	4−5, 5+2	9·2*b*
20	2618	22	Ni	4 (4) v (4) 5	9·1
20	2618	45	Br	4+1	8·6
22	2620	50	Bn	4 (2) v (1) 5	9·2
25	2623	55	Bo	P (7) v (1) 4	8·5
25	2623	30	Tn	4+2	8·5
28	2626	22	Ni	=4	8·7*b*
29	2627	55	Bg	=4	8·7
30	2628	,,	Bo	4 (1) v (4) 5	8·9
30	2628	50	Bn	4 (1) v (2) 5	8·9
Nov					
1	2630	55	Bg	4−6, 5+1	9·3
1	2630	30	D	e−3, 4+1·5	8·6
1	2630	22	Ni	4 (4) v (4) 5	9·1
1	2630	50	Ma	1 (4) v (1) 9, 9+4	9·3
4	2633	55	Bo	4 (1) v (3) 5	8·9
4	2633	30	Bn	4 (1) v (2) 5	8·9
5	2634	47	Gi	4−1·5, 5+4	8·9
6	2635	79	Ma	1 (7) v (1) 9, 9+4	9·6
6	2635	22	Ni	4 (4) v (3·5) 5	9·1
8	2637	55	Bo	4 (1) v (3) 5	8·9
8	2637	30	D	4−0·5	8·8
12	2641	55	Bg	4−6, 5+1	9·3*b*
13	2642	45	Br	4−2	8·9
16	2645	55	Bo	4 (3) v (1) 5	9·2
16	2645	,,	Bg	5−1, 6+1	9·5
16	2645	79	Ma	9+2	9·9
16	2645	22	Ni	4 (5) v (2) 5	9·2
17	2646	30	D	4−4, 5+3	9·1
18	2647	75	Gi	4−3, 5+4	9·0
18	2647	79	Ma	7+7, 9+5	9·2
19	2648	55	Bg	5−1, 6+1	9·5
20	2649	,,	Bo	4 (2) v (1) 5	9·2
21	2650	50	Bn	4 (4) v (1) 5	9·3
21	2650	22	Ni	4 (5) v (2·5) 5	9·2
21	2650	30	Tn	4 (5) v (5) 5	9·1*b*
1920 Dec					
1	2660	55	Bg	9−1·5, 12+3·5	10·2
1	2660	50	Bn	6 (2) v (1) 9	9·9
1	2660	94	Ni	5 (5) v (4) 7	9·5
1	2660	60	Tn	9−1	10·2
3	2662	55	Bo	9 (1) v (3) 10	10·1
5	2664	60	Tn	9 (2) v (8) 11	10·2
7	2666	117	Gi	7−2·5, 10+2·5	9·9
8	2667	45	Br	9−2	10·3
8	2667	60	Tn	9 (5) v (5) 11	10·4
9	2668	50	Bn	9 (5) v (1) 13, 11+1	10·6
10	2669	79	Ma	=10, 14−1	10·8
12	2671	55	Bo	12 (1) v (1) 11	10·7
22	2681	150	Tn	11 (7) v (3) 16	11·6*b*
26	2685	75	Bg	=16	11·9*b*
27	2686	94	Ni	14 (5) v (1) 16	11·8
27	2686	150	Tn	18+2	12·1
28	2687	75	Bg	18−1, 19+3	12·5
31	2690	45	Br	18+4	11·9
31	2690	85	Bn	18 (3) v (2) 19	12·6*b*
1921 Jan					
1	2691	150	Tn	18 (5) v (5) 19	12·6
4	2694	,,	,,	=19	12·8
7	2697	,,	,,	=20	13·3
9	2699	117	Gi	18−3, 26+1·5	13·1*b*
13	2703	150	Tn	22 (5) v (5) 26	13·4
13	2703	120	Br	=19	12·8*b*
14	2704	160	Bo	=24	13·4
16	2706	94	Ni	=28	13·6
16	2706	150	Tn	=28	13·6*b*
26	2716	,,	,,	26−1	13·8
27	2717	160	Bo	=26	13·7
27	2717	117	Gi	=28	13·6
30	2720	94	Ni	28−2	13·8
31	2721	150	Bn	<20	<13·3
Feb					
1	2722	160	Bo	26−1	13·8
2	2723	75	Bg	=19	12·8*b*
2	2723	150	Bn	19−3	13·1*b*
2	2723	,,	Tn	<20	<13·3*b*
5	2726	183	Ma	<24	<13·4
5	2726	160	Bo	26−1	13·8
8	2729	150	Tn	=26	13·7*b*
9	2730	117	Gi	=26	13·7*b*
10	2731	150	Tn	28−2	13·8
11	2732	,,	,,	=28	13·6*b*
12	2733	94	Ni	20 (4) v (0·5) 28	13·6
16	2737	,,	,,	20−3	13·6
17	2738	150	Tn	<20	<13·3*b*
19	2740	94	Ni	20 (3) v (3) 28	13·4
23	2744	,,	,,	=20	13·3
24	2745	160	Bo	18 (3) v (1) 19	12·7*b*
24	2745	55	Bg	18−3	12·6*b*
25	2746	240	Br	=18	12·3
25	2746	117	Gi	=17, 20+3	12·6*b*
25	2746	150	Tn	19+3	12·5
26	2747	94	Ni	16 (2) v (2) 20	12·6

Dec. 1, Ni, With 22, 9·5.
Jan. 13, Br, About. Difficult.
Jan. 16, Ni, About.
Jan. 31. 20 Glimpsed. R not seen.
Feb. 2, Bg, About. Difficult. Tn, Invisible.
Feb. 5, Ma, Invisible.
Feb. 8, Glimpsed.
Feb. 17, Invisible.
Feb. 24, Bg, About. Difficult.

(782) R ARIETIS—*continued.*

1921 Feb					
26	2747	120	Bn	18 (1) v (3) 19	12·4
Mar					
2	2751	,,	,,	15 (3) v (1) 16	11·7
2	2751	65	Bg	14−6, 16+1	11·8
2	2751	150	Tn	15 (5) v (5) 18	11·8
2	2751	160	Bo	=16	11·9
7	2756	55	Bo	12 (1) v (1) 13	10·7
11	2760	94	Ni	7 (7) v (1) 10	10·2
11	2760	117	Gi	=12	10·5*b*
12	2761	55	Bo	9 (3) v (1) 10	10·2
17	2766	,,	,,	9 (3) v (1) 10	10·2
20	2769	160	Br	9−8, =11, 14+3	10·8*b*
25	2774	94	Ni	7 (4) v (4) 10	9·9*b*
26	2775	50	Bn	5 (2) v (1) 6	9·5
29	2778	45	Br	5−1, 6+1	9·5*b*
29	2778	94	Ni	5 (3) v (4) 7	9·5
Apr					
2	2782	47	Gi	5+1, 6+2·5, 9+4	9·4*b*
6	2786	30	Bn	4 (3) v (1) 6	9·4*b*
June					
25	2866	94	Ni	7 (5) v (4) 10	10·0
26	2867	117	Gi	7−3, 10+4	9·9
July					
2	2873	94	Ni	7 (6) v (2) 10	10·1
6	2877	117	Gi	=12, =14	10·8
7	2878	94	Ni	10 (1·5) v (1·5) 14	10·7*b*
9	2880	,,	,,	10 (3) v (1·5) 14	10·9*b*
16	2887	117	Gi	14−6, 16+1	11·8*b*
30	2901	,,	,,	=22	13·2
31	2902	60	D	<11	<10·8*b*
Aug					
9	2911	117	Gi	18−2·5, 19+1	12·6
15	2917	94	Ni	16 (2·5) v (2·5) 20	12·6
26	2928	,,	,,	10 (2) v (2) 14	10·7*b*
28	2930	,,	,,	10 (2) v (3) 14	10·6
28	2930	117	Gi	10−1, 12+2	10·4
28	2930	60	D	11−2	11·0*b*
31	2933	,,	,,	11−2, 14+2	11·0*b*
Sept					
1	2934	94	Ni	7 (6) v (3) 10	10·0
1	2934	60	D	11−1, 14+3	10·9
2	2935	55	Bo	9 (2) v (1) 10	10·2
5	2938	160	Br	9−4, 11+3	10·5
5	2938	75	Bn	9 (3) v (1) 12	10·4
5	2938	30	D	9−6, 11+2	10·6
6	2939	94	Ni	7 (5) v (4) 10	10·0
6	2939	140	Bo	9 (2) v (1) 10	10·2
7	2940	85	Bn	9 (1) v (1) 12	10·3
7	2940	117	Gi	7−2, 10+3	9·9
7	2940	30	D	9−6, 11+3	10·6
8	2941	,,	,,	9−4, 11+4	10·4
10	2943	75	Bn	9−1	10·2
14	2947	60	D	6−4, 9+2	9·9
15	2948	75	Bn	6−1, 9+3	9·7
21	2954	50	,,	4 (5) v (1) 5	9·3
22	2955	94	Ni	4 (6) v (1·5) 5	9·3
22	2955	60	D	4−5, 5+2	9·2
24	2957	30	,,	4−4, 5+3	9·1
24	2957	50	Bn	5+1	9·3
24	2957	55	Bo	4 (4) v (3) 5	9·1*b*
25	2958	,,	Bg	6−1, 9+3	9·7
25	2958	45	Br	4−3, 5+3	9·1
25	2958	75	Gi	4−6, 5+4	9·2
27	2960	30	D	4−4, 5+3	9·1
1921 Sept					
27	2960	55	Bo	4 (2) v (5) 5	8·9
28	2961	,,	Bg	=5, 6+2	9·4
29	2962	50	Bn	4 (3) v (2) 5	9·1
29	2962	22	Ni	4 (2) v (4) 5	8·9
30	2963	30	D	4−2, 5+5	8·9
Oct					
1	2964	50	Bn	4 (1) v (4) 5	8·9
1	2964	30	Tn	4+3	8·4*b*
2	2965	48	Bg	4+2	8·5
3	2966	55	Bo	P (9) v (1) 4	8·5
4	2967	50	Bn	4+1·5	8·6
5	2968	30	D	d−3, e+2	8·1
5	2968	50	Gr	=4	8·7
6	2969	55	Bg	4+2	8·5
7	2970	,,	Bo	P (4) v (1) 4	8·4
7	2970	47	Gi	3+2·5	8·1
8	2971	50	Bn	=3	8·3
9	2972	22	Ni	3+0·5	8·3
14	2977	25	Bn	3+3	8·0
16	2979	,,	,,	e+3, 3+3	8·0
16	2979	23	Bo	P (1) v (2) 4	7·6*b*
16	2979	55	Bg	4−1, 5+6	8·8
19	2982	30	Tn	2 (7) v (3) 4	8·2
19	2982	55	Bg	P−9, 4+7	8·0
20	2983	50	Gr	4+5	8·2
21	2984	55	Bo	P (1) v (1) 4	7·9*b*
23	2986	25	Bn	3+2	8·1
23	2986	30	Tn	2 (7) v (3) 4	8·2
24	2987	,,	Bg	P−9, 4+7	8·0*b*
24	2987	22	Ni	T (6) v (2·5) 3	8·1
25	2988	45	Br	4+4	8·3
28	2991	48	Bg	P−11, 4+5	8·2*b*
29	2992	55	Bo	P (3) v (1) 4	8·3*b*
30	2993	50	Gr	4+5	8·2
31	2994	47	Gi	2−16, 3+3·5	8·2
Nov					
1	2995	25	Bn	3+1	8·2
6	3000	30	,,	3+0·5	8·3
6	3000	55	Bo	P (4) v (1) 4	8·4*b*
6	3000	45	Br	4+6	8·1
7	3001	30	Tn	2 (7) v (3) 4	8·2
10	3004	22	Ni	T (6) v (2·5) 3	8·1
11	3005	55	Bo	P (7) v (1) 4	8·5
17	3011	,,	,,	P (3) v (1) 4	8·3*c*
17	3011	50	Gr	=4	8·7
21	3015	47	Gi	3+2	8·1
22	3016	22	Ni	T (6) v (1) 3	8·2
22	3016	55	Bo	P (9) v (1) 4	8·5*b*
23	3017	50	Bn	4+1	8·6
24	3018	30	D	4+2	8·5
25	3019	55	Bo	P (9) v (1) 4	8·5*b*
26	3020	22	Ni	T (7) v (1) 3	8·2
27	3021	45	Br	4+1	8·6
27	3021	50	Bn	4 (2) v (3) 5	9·0
29	3023	55	Bg	=5, 6+2	9·4*b*
30	3024	50	Gr	=5	9·4
Dec					
2	3026	22	Ni	4 (3) v (3) 5	9·1
3	3027	30	Tn	4+2	8·5
4	3028	,,	D	4−2, 5+5	8·9
4	3028	50	Bn	=5	9·4
7	3031	55	Bg	5−2, =6	9·6*b*
17	3041	,,	,,	6−3, 9+1·5	9·9
17	3041	,,	Bo	5 (2) v (1) 6	9·5

Aug. 28, D, Difficult.
Sept. 22, Ni, With 22, 9·3.

Nov. 6, Br, About.

(782) R ARIETIS—*continued.*

1921 Dec.					
17	3041	79	Ma	9−0·5	10·1
18	3042	30	D	4−6, 5+1	9·3*b*
21	3045	50	Gr	7−2	9·8
22	3046	55	Bg	6−4, 9+1	10·0*b*
23	3047	160	Br	9+1	10·0
24	3048	55	Bo	9 (1) v (2) 10	10·1
24	3048	94	Ni	7 (3) v (4) 10	9·9
25	3049	75	Bn	=9	10·1
27	3051	117	Gi	9−2·5, 10+4, 11+3	10·2
28	3052	55	Bg	=9	10·1
28	3052	75	Bn	9 (2) v (1) 13	10·5
28	3052	94	Ni	7 (1·5) v (6) 10	9·7
29	3053	79	Ma	9 (3) v (2) 14	10·7
31	3055	55	Bo	9 (2) v (1) 10	10·2
31	3055	75	Bn	9 (5) v (1) 13	10·6
1922 Jan.					
3	3058	,,	,,	9 (3) v (1) 13	10·6
3	3058	160	Br	14+2	11·0
7	3062	...	Gi	12 (0·5) v (1·5) 11	10·6
10	3065	140	Bo	13 (3) v (1) 14	11·1
14	3069	94	Ni	14 (1) v (5) 16	11·3
16	3071	55	Bg	14−1, 16+6	11·3
16	3071	79	Ma	14−5	11·7*b*
17	3072	55	Bo	15 (3) v (3) 16	11·6
17	3072	85	Bn	16 (1) v (3) 18	12·0
19	3074	...	Gi	=16	11·9
21	3076	120	Br	18−1	12·4
30	3085	160	Bo	18 (3) v (2) 19	12·6*b*
Feb.					
1	3087	,,	,,	18 (3) v (2) 19	12·6
1	3087	75	Bg	16−3, 18+1	12·2
7	3093	275	,,	19 (1) v (3) 22	12·9
9	3095	183	Ma	=19	12·8*c*
14	3100	94	Ni	20 (2) v (2) 28	13·4
14	3100	...	Gi	18+2	12·1
18	3104	120	Bn	18 (1) v (3) 19	12·4
18	3104	,,	Br	18+1	12·2
18	3104	75	Bg	16−3, 18+1	12·2
20	3106	70	Gr	=18	12·3
20	3106	225	Bo	16 (3) v (1) 18	12·2
25	3111	94	Ni	14 (3) v (3) 16	11·5
25	3111	23	Bo	16+2	11·7*b*
26	3112	...	Gi	10−2, =14	10·8
27	3113	140	Bo	15 (2) v (4) 26	11·5
27	3113	94	Ni	14 (3) v (4) 16	11·5
Mar.					
4	3118	160	Br	=14	11·2
4	3118	50	Bn	10 (1) v (3) 12	10·3
9	3123	,,	,,	9 (1) v (1) 11	10·4
13	3127	94	Ni	7+1	9·5
16	3130	70	Gr	=9	10·1
18	3132	94	Ni	7+5	9·1
20	3134	50	Bn	6 (1) v (3) 9	9·7
Apr.					
2	3147	94	Ni	4 (4·5) v (4) 5	9·1
June					
5	3211	,,	,,	Estimated	8·7*c*
24	3230	150	Wf	7−5, 10+1	10·1
July					
4	3240	80	Ca	12−1, 13+2	10·6
5	3241	...	Gi	10 (2) v (1) 12	10·4
12	3248	94	Ni	14 (2) v (1) 16	11·6*b*

Jan. 16, Ma, Difficult.

1922 July					
19	3255	...	Gi	12 (4) v (2) 18	1
21	3257	120	Br	18−1·5, 19+3	1
23	3259	157	Wf	18 (1) v (1) 19	1
Aug.					
1	3268	...	Gi	=18	1
7	3274	94	Ni	20 (2) v (3) 28	1
15	3282	,,	,,	16 (4) v (1) 20	1
16	3283	150	Wf	20−2, 26+4	1
19	3286	...	Gi	=22	1
20	3287	157	Wf	18−2, 19+1	1
21	3288	94	Ni	16 (4) v (3) 20	1
23	3290	75	Bg	18−3, 19+2	1
23	3290	120	Br	18−1·5, 19+3	1
23	3290	150	Wf	=18	1
26	3293	75	Bg	18−2, 19+3	1
27	3294	94	Ni	14 (4) v (2) 16	1
27	3294	150	Wf	=16, 18+3	1
29	3296	...	Gi	=16, 17+2·5	1
Sept.					
3	3301	150	Wf	11−4, 16+6	1
3	3301	94	Ni	14 (1) v (5) 16	1
10	3308	,,	,,	=10	1
13	3311	62	Wf	9−2, 12+3	1
13	3311	32	Ca	9 (3) v (2) 12	1
15	3313	150	Lp	9 (2) v (2) 11	1
16	3314	62	Wf	9 (1) v (1) 12	1
17	3315	94	Ni	7 (1·5) v (5·5) 10	
17	3315	160	Br	9−4, 11+4	1
19	3317	150	Wf	=9, 11+7	1
19	3317	...	Gi	9 (1·5) v (2·5) 11	1
20	3318	55	Bg	11−1·5, 14+3	1
20	3318	50	Bn	9 (1) v (2) 11	1
20	3318	100	Lp	=9	1
23	3321	62	Wf	7−4, 10+2	1
24	3322	100	Lp	=9	1
28	3326	140	Bo	9 (1) v (1) 10	1
28	3326	31	D	9−1, 11+5	1
29	3327	55	Bg	9−2·5, 11+5	1
29	3327	50	Bn	6 (1) v (1) 9	
29	3327	100	Lp	=7	
Oct.					
1	3329	45	Br	5−1, 6+1	
6	3334	50	Bn	4 (4) v (1) 5	
6	3334	100	Lp	5 (2) v (2) 7	
7	3335	,,	,,	=5	
7	3335	94	Ni	4 (10) v (3·5) 5	
11	3339	62	Wf	4−3, 5+4	
11	3339	55	Bg	5−2, =6	
11	3339	32	Ca	4 (4) v (3) 5	
12	3340	55	Bo	4 (4) v (3) 5	
12	3340	50	Bn	4 (2) v (1) 5	
12	3340	37	Lp	4 (2) v (2) 5	
13	3341	31	D	4−4, 5+3	
13	3341	...	Gi	4 (2) v (6) 5	
13	3341	22	Ni	4 (5) v (2·5) 5	
14	3342	62	Wf	4−2, 5+5	
15	3343	55	Bo	4−1	
15	3343	50	Bn	4 (2) v (1) 5	
15	3343	37	Lp	4 (1) v (4) 5	
16	3344	55	Bg	4−4, 5+2	
18	3346	37	Lp	=4	
18	3346	22	Ni	=4	
19	3347	32	Ca	4 (2) v (5) 5	
21	3349	45	Br	4+2	

July 21, Difficult.
Oct. 7, Ni, With 22, 9·2.

(782) R ARIETIS—*continued.*

1922 Oct 22	3350	50	Bn	4 (3) v (2) 5	9·1
22	3350	31	D	4+1	8·6
22	3350	37	Lp	=4	8·7
24	3352	,,	,,	4+1	8·6
25	3353	55	Bo	4+4	8·3*b*
25	3353	,,	Bg	4−3, 5+4	9·0
25	3353	22	Ni	4 (3) v (4) 5	9·0
26	3354	37	Lp	P (4) v (1) 4, 4+3	8·4*c*
28	3356	,,	,,	4+3	8·4
28	3356	32	Ca	3 (2) v (2) 4	8·5
28	3356	30	Bn	3 (1) v (1) 4	8·5
Nov 1	3360	55	Bg	4+3	8·4
1	3360	37	Lp	P (3) v (1) 4	8·3*b*
1	3360	32	Ca	4+5	8·2
3	3362	,,	,,	4+5	8·2
5	3364	...	Gi	2 (15) v (3) 3	8·1
7	3366	37	Lp	P (7) v (3) 4	8·2*c*
9	3368	55	Bo	4+4	8·3*b*
9	3368	,,	Bg	4+4	8·3*b*
9	3368	37	Lp	P (2) v (1) 4	8·2
11	3370	,,	,,	P (2) v (1) 4	8·2
11	3370	22	Ni	T (5) v (1) 3, T (5) v (2·5) 4	8·3
11	3370	45	Br	4+3	8·4
15	3374	37	Lp	v (2) 4 (2) 5, 4+2	8·3*b*
15	3374	31	D	d−5·5, 4+3·5	8·4
16	3375	32	Ca	Estimated	8·3
18	3377	62	Wf	4+3	8·4*b*
18	3377	37	Lp	4+1	8·6
23	3382	,,	,,	4+2	8·5*b*
23	3382	60	Kw	1 (7) v (1) 4, 4+5	8·3
24	3383	22	Ni	3 (1·5) v (1·5) 4	8·5
24	3383	79	Ma	7+4	9·2
24	3383	32	Ca	Estimated	8·3
24	3383	30	Bn	3 (2) v (1) 4	8·6
24	3383	45	Br	4−2, 5+4	9·0
24	3383	30	Bg	4+2	8·5*b*
25	3384	55	Bo	4+3	8·4*b*
25	3384	37	Lp	4+2	8·5*b*
30	3389	...	Gi	3+1·5	8·2
Dec 6	3395	37	Lp	4 (2) v (2) 5	9·1*b*
6	3395	30	Bn	4 (2) v (1) 5	9·2
6	3395	55	Bg	4−4, 5+2	9·2*b*
7	3396	32	Ca	4 (3) v (4) 5	9·0
8	3397	22	Ni	4 (4) v (2·5) 5	9·1
14	3403	55	Bo	4 (3) v (4) 5	9·0
16	3405	37	Lp	=6	9·6*b*
18	3407	50	Bn	4 (1) v (1) 5	9·1
19	3408	55	Bo	4 (4) v (3) 5	9·1
19	3408	45	Br	5−1, 6+1	9·5
19	3408	22	Ni	4 (7) v (0·5) 5	9·4
20	3409	37	Lp	6 (2) v (2) 9	9·8
22	3411	55	Bg	6−1, 9+3	9·7*b*
23	3412	37	Lp	9 (2) v (2) 11	10·4
24	3413	75	Bn	=6	9·6
26	3415	55	Bo	5 (1) v (1) 6	9·5
26	3415	100	Lp	9 (2) v (1) 11	10·5
1923 Jan 3	3423	75	Bn	9 (2) v (1) 13	10·5
4	3424	55	Bg	9−6, 11+1	10·7*b*
1923 Jan 6	3426	100	Lp	14 (2) v (2) 16	11·5
6	3426	55	Bo	15 (2) v (4) 16	11·5*b*
6	3426	94	Ni	7 (7) v (2) 10	10·1
7	3427	,,	Li	12 (5) v (5) 14	10·8
10	3430	55	Bg	14−1, 16+6	11·3
12	3432	100	Lp	=16	11·9*b*
14	3434	,,	,,	16 (2) v (2) 17	12·1
14	3434	120	Bn	16−3, 18+1	12·2
14	3434	,,	Br	18+3	12·0
14	3434	94	Li	=16	11·9
14	3434	80	Ca	15 (2) v (4) 16	11·5
14	3434	94	Ni	14 (3) v (3) 16	11·5
15	3435	75	Bg	16−1, 18+3	12·0
16	3436	100	Lp	=17	12·3*b*
17	3437	140	Bo	18 (2) v (3) 19	12·5*b*
18	3438	117	Gi	16 (4) v (1·5) 20	12·9*b*
20	3440	150	Lp	=18	12·3
20	3440	94	Li	19 (5) v (5) 20	13·0
20	3440	79	Ma	18+1, 19+2	12·4
20	3440	94	Ni	16 (5) v (1) 20	13·0
23	3443	157	Wf	=19	12·8
Feb 4	3455	150	Bn	19−3, 20−3	13·3*b*
4	3355	,,	Lp	<20	<13·3*b*
5	3456	120	Br	19−2	13·0
6	3457	94	Ni	28−1	13·7*b*
7	3458	157	Wf	28−1	13·7
11	3462	120	Bn	26−1	13·8
11	3462	140	Bo	<28	<13·6
13	3464	94	Ni	28−3	13·9*b*
17	3468	,,	,,	28−4	14·0
Mar 5	3484	32	Ca	<17	<12·3
17	3496	94	Ni	14 (5) v (1) 16	11·8
18	3497	120	Bn	15−4, 16+2	11·7*b*
19	3498	117	Gi	14 (6) v (2) 16	11·7*b*
25	3504	94	Ni	=14	11·2*b*
Apr 5	3515	117	Gi	=11, 12+2	10·6
6	3516	150	Wf	9−8, 11+1, 14+5	10·7*b*
July 6	3607	100	Lp	7 (2) v (2) 10	9·9*c*
7	3608	94	Ni	7 (5) v (3) 10	10·0
8	3609	150	Wf	9−4, 12+2	10·4
9	3610	117	Gi	7−2·5, 9−1	10·0
12	3613	94	Ni	=10	10·3
18	3619	100	Lp	=14	11·2*b*
19	3620	62	Wf	11−6, 16+6	11·3
20	3621	60	D	<11	<10·8*b*
20	3621	100	Lp	14 (2) v (2) 16	11·5*b*
Aug 1	3633	94	Ni	16 (3) v (1) 20	12·9
5	3637	157	Wf	18−3, =19	12·7*b*
6	3638	120	Ga	=19	12·8
8	3640	,,	Bn	20 (2) v (1) 26	13·6
12	3644	157	Wf	20−2, 27+3	13·4
15	3647	,,	,,	20−3, 26+3	13·5
15	3647	150	Lp	<19	<12·8*b*

Oct. 22, Lp, Yellow.

Jan. 7, 12, Difficult.
Jan. 14, Bn, t.
Jan. 20, Li, Very difficult.
Feb. 4, Lp, Not seen.
Mar. 25, About.
Aug. 15, Lp, Not seen.

(782) R ARIETIS—*continued.*

1923					
Sept					
2	3665	94	Ni	20 (5) v (1) 28	13·6
3	3666	157	Wf	20−3, 26+2	13·5
5	3668	150	Lp	20−1	13·4*b*
6	3669	94	Ni	20 (4) v (2) 28	13·5
7	3670	120	Br	=19	12·8
7	3670	60	Ga	<20	<13·3
7	3670	150	Lp	19 (2) v (2) 20	13·0*b*
8	3671	157	Wf	=20	13·3*b*
11	3674	150	Lp	18 (2) v (2) 19	12·6*b*
12	3675	300	Wf	=18, 19+3	12·4
13	3676	94	Ni	16 (3) v (2) 20	12·7
15	3678	160	Br	18+2	12·1
15	3678	120	Bn	16 (2) v (3) 18	12·1
15	3678	100	Lp	=16	11·9*b*
18	3681	150	,,	14 (4) v (1) 16	11·7*b*
18	3681	94	Ni	14 (1) v (4) 16	11·3
18	3681	60	D	14 (4) v (1) 17, 17+3	12·1
21	3684	150	Lp	=14	11·2*b*
22	3685	,,	Wf	11−2, =14, 16+6	11·1*b*
23	3686	50	Bn	9 (4) v (1) 11	10·6
30	3693	150	Wf	7−3, 10+3	9·9
30	3693	94	Ni	7 (4) v (5) 10	9·9
30	3693	60	D	9−3, 11+5	10·3
30	3693	32	Ca	9 (1) v (1) 10	10·2
30	3693	140	Bo	9 (1) v (1) 10	10·2*b*
30	3693	160	Br	9−1	10·2
30	3693	75	Bg	9 (2) v (3) 11	10·3
30	3693	150	Lp	9 (2) v (2) 10	10·2*b*
Oct					
1	3694	...	Gr	=7	9·6
4	3697	120	Bn	9+1	10·0
4	3697	100	Lp	=7	9·6
6	3699	60	Ga	5−2, =7, 9+5	9·6
9	3702	62	Wf	6−1·5, 9+3	9·8
9	3702	160	Br	9+1	10·0
10	3703	32	Ca	6 (1) v (5) 10	9·7
13	3706	37	Lp	5 (2) v (2) 6	9·5*b*
13	3706	...	Gr	=7	9·6
14	3707	55	Bg	5 (1) v (2) 6	9·5
14	3707	50	Bn	5 (1) v (1) 6	9·5
15	3708	94	Ni	5+1	9·3
15	3708	30	D	4−5, 5+3	9·2
16	3709	55	Bo	4 (3) v (4) 5	9·0
17	3710	30	D	4−4, 5+3	9·1
19	3712	32	Ca	4 (4) v (3) 5	9·1
22	3715	55	Bo	4 (3) v (4) 5	9·0
22	3715	37	Lp	3 (2) v (2) 4	8·5*b*
22	3715	55	Bg	4 (1) v (3) 5	8·9
25	3718	22	Ni	3 (1) v (2) 4	8·4*b*
26	3719	30	Bg	P (4) v (1) 4	8·4*b*
26	3719	60	Ga	4+2	8·5
26	3719	32	Ca	4+3	8·4
28	3721	55	Bo	4+2	8·5*b*
28	3721	50	Bn	3 (3) v (1) 4	8·6
29	3722	30	D	d−3, e+2	8·1
30	3723	62	Wf	4+4	8·3
31	3724	45	Br	=3	8·3
Nov					
2	3726	30	D	d−1, e+3	7·9*b*
3	3727	32	Ca	4+5	8·2
3	3727	37	Lp	P (3) v (2) 4	8·1
4	3728	22	Ni	T (5) v (2·5) 3	8·1

1923					
Nov					
4	3728	50	Bn	3+1	8·
4	3728	45	Br	4+6	8·
4	3728	30	Bg	4+1	8·
4	3728	,,	D	=d	7·
7	3731	,,	,,	d−1, e+4	7·
8	3732	32	Ca	4+7	8·
8	3732	37	Lp	3+1	8·
10	3734	30	Bg	P (4) v (1) 4	8·
10	3734	25	Bn	3+3, d+1	7·
10	3734	55	Bo	4+4	8·
10	3734	30	D	d−1, e+3	7·
11	3735	37	Lp	P (3) v (1) 3, v (3) 3 (2) 4	7·
14	3738	100	,,	P (3) v (2) 3	7·
14	3738	22	Ni	T (5) v (2) 3	8·
15	3739	30	Bg	P (6) v (1) 4	8·
17	3741	50	Bn	3+2	8·
17	3741	100	Lp	P (2) v (1) 3	7·
24	3748	32	Ca	4+6	8·
30	3754	30	D	d−4, e+2	8·
30	3754	50	Bn	3 (1) v (3) 4	8·
30	3754	55	Bg	P (7) v (1) 4	8·
Dec					
2	3756	100	Lp	3+1	8·
3	3757	30	Bg	P (8) v (1) 4	8·
3	3757	45	Br	4+2	8·
3	3757	55	Bo	4+5	8·
4	3758	50	Bn	3 (1) v (1) 4	8·
5	3759	32	Ca	4+4	8·
9	3763	100	Lp	3+1	8·
9	3763	30	D	d−3, e+1, 4+5	8·
9	3763	22	Ni	4 (4) v (3) 5	9·
10	3764	32	Ca	4+2	8·
11	3765	55	Bo	4+2	8·
15	3769	22	Ni	4 (3) v (4) 5	9·
15	3769	100	Lp	=3	8·
15	3769	50	Bn	4 (1) v (3) 5	8·
15	3769	55	Bg	4+1	8·
18	3772	32	Ca	=4	8·
19	3773	100	Lp	3 (2) v (2) 4	8·
20	3774	50	Bn	4 (1) v (2) 5	8·
23	3777	55	Bg	4 (1) v (4) 5	8·
23	3777	100	Lp	4 (1) v (2) 5	8·
24	3778	30	D	4+1·5	8·
28	3782	55	Bg	4 (4) v (1) 5	9·
30	3784	30	D	4−4, 5+3	9·
30	3784	22	Ni	4 (7) v (1) 5	9·
30	3784	32	Ca	8 (1) v (2) 9	9·
1924					
Jan					
2	3787	50	Bn	5 (4) v (1) 6	9·
2	3787	100	Lp	5 (1) v (2) 6	9·
3	3788	45	Br	9+1	10·
5	3790	75	Bg	6 (1) v (2) 9	9·
5	3790	100	Lp	5 (2) v (1) 6	9·
5	3790	55	Bo	5 (1) v (1) 6	9·
5	3790	40	D	5−2, 9+5	9·
6	3791	22	Ni	5 (2) v (1) 7	9·
6	3791	32	Ca	=9	10·

Sept. 7, Ga, Glimpsed, T. Lp, Difficult. Not steadily held.
Oct. 6, 26, Ga, T.
Oct. 15, Ni, With 22, 9·4.

Nov. 4, Bg, 2^c.
Nov. 7, 4^c.
Ni remarks that the magnitudes of the fai comparison stars cannot possibly be corre He considers, for instance, that 20 and are each as much as a magnitude too fai

(782) R ARIETIS—*continued.*

1924 Jan					
6	3791	50	Bn	6 (1) v (3) 9	9·7
11	3796	55	Bo	9 (1) v (1) 10	10·2
12	3797	94	Ni	7 (2) v (5) 10	9·8
12	3797	40	D	9−4, 11+2	10·5
15	3800	,,	,,	9−5	10·6*b*
15	3800	55	Bo	9 (1) v (1) 10	10·2
23	3808	94	Ni	=10	10·3
23	3808	40	D	11−3, 14+1	11·1
25	3810	50	Bn	15 (1) v (2) 16	11·5
25	3810	55	Bo	16 (1) v (3) 18	12·0
25	3810	160	Br	14−4, 16+4	11·5
27	3812	60	D	14−3, 16+5	11·4*b*
27	3812	100	Lp	=16	11·9
27	3812	75	Bg	14 (3) v (1) 16	11·7
29	3814	80	Ca	=18	12·3
31	3816	130	Bo	18 (1) v (3) 29	12·4*b*
Feb					
1	3817	120	Bn	16 (3) v (2) 18	12·1
1	3817	150	Wf	=16, 18+3	12·0
1	3817	80	D	16−1, 18+2	12·1
2	3818	150	Lp	=18	12·3
8	3824	157	Wf	18−2, =19	12·7
9	3825	32	Ca	<17	<12·3
14	3830	94	Ni	16 (4) v (0·5) 20	13·1
16	3832	130	Bo	<20	<13·3*b*
22	3838	94	Ni	20 (3) v (1) 28	13·5
22	3838	150	Bn	19−5, 20−3, 26−1	13·6
28	3844	120	Br	19+1	12·7
Mar					
1	3846	94	Ni	20 (3) v (3) 28	13·4*b*
2	3847	150	Bn	20−2	13·5*b*
4	3849	,,	,,	20 (3) v (1) 26	13·6
5	3850	94	Ni	20 (4) v (1·5) 28	13·5
7	3852	167	Bn	20 (2) v (1) 26	13·6
8	3853	94	Ni	20 (3) v (3) 28	13·4
23	3868	170	Ry	11−3, =12, 14+3	10·8
23	3868	80	Ca	13 (3) v (1) 14	11·1
27	3872	50	Ry	10−1, 11−1	10·6
29	3874	120	Bn	9 (4) v (1) 15	11·0*b*
30	3875	94	Ni	7 (6) v (3) 10	10·0
Apr					
1	3877	50	Bn	9−5	10·6*b*
3	3879	,,	Ry	9−2, 11+2	10·4
6	3882	,,	,,	7−3, 11+4	10·1
June					
6	3943	,,	,,	=R, e+3, 4+5	8·0
8	3945	30	,,	R−1·5, e+2, 4+3·5	8·1
18	3955	20	,,	R−2, e+2, 4+3	8·2*b*
23	3960	62	Wf	4−4, 5+4	9·1
24	3961	30	Ry	=4	8·7
28	3965	62	Wf	4−1, 5+5	8·9*b*
29	3966	30	Ry	4−1, 5+2·5	9·0
July					
1	3968	,,	,,	4−1, 5+1	9·1
2	3969	22	Ni	4 (4) v (1) 5	9·3*b*
5	3972	62	Wf	4−5, 5+2, 9+7	9·3
8	3975	30	Ry	=4, 5−4, 7+1, 9+4	9·4
10	3977	94	Ni	5+1	9·3
11	3978	32	Ca	7 (1) v (1) 8	9·7
11	3978	62	Wf	5−6, 9+1	10·0
11	3978	50	Bn	6 (2) v (1) 9	9·9
19	3986	80	Ry	=11, 14+2	10·9
19	3986	62	Wf	=10, 11+5	10·3
22	3989	,,	,,	=12	10·5*b*
22	3989	94	Ni	7 (7) v (2) 10	10·1
25	3992	50	Ry	14+0·5, 15+1	11·1
27	3994	62	Wf	14+1	11·1*b*
29	3996	120	Bn	<11	<10·8
30	3997	80	Ry	14−4, 16+2, 17+4	11·7
Aug					
1	3999	150	Wf	16−1, 17+2	12·1
5	4003	80	Ry	15−1·5, 17+0·5	11·8
6	4004	157	Wf	=17, 19+4	12·3
7	4005	120	Bn	18+1	12·2*b*
22	4020	75	Bg	=19	12·8*b*
22	4020	157	Wf	20−2, 26+3	13·4
27	4025	120	D	22−1	13·3*b*
30	4028	170	Ry	19−2, 20+2	13·0
31	4029	157	Wf	20−4, 26+2	13·6
Sept					
7	4036	,,	,,	20−2, 26+4	13·4
9	4038	120	Bn	=20	13·3*b*
10	4039	160	Ry	18−3, 19−2	12·8
22	4051	75	Bg	=16	11·9
22	4051	120	Bn	15 (5) v (2) 16	11·7
22	4051	100	Lp	=18	12·3*b*
22	4051	60	D	16−1, 18+3	12·0
24	4053	100	Lp	=16	11·9*b*
24	4053	60	Kw	11 (4) v (1) 16, 14−3, 14 (1) v (1) 16	11·6
26	4055	160	Ry	14−2	11·4
27	4056	32	Ca	11 (1) v (3) 14	10·9
27	4056	160	Br	14+2	11·0
27	4056	150	Wf	11−4, =15	11·2
27	4056	75	Bn	13 (3) v (1) 15	11·1
Oct					
3	4062	100	Lp	11 (2) v (2) 14	11·0*b*
3	4062	32	Ca	9 (5) v (2) 11	10·6
5	4064	62	Wf	9−6, =12	10·6
8	4067	50	Ry	11−2·5, 13+4, 14+1	10·8*b*
8	4067	75	Bg	=11	10·8*b*
9	4068	32	Ca	9 (3) v (4) 11	10·4
16	4075	50	Ry	7−1·5, 9−3, 11+3·5	10·2*b*
16	4075	32	Ca	6 (3) v (2) 9	9·9
17	4076	100	Lp	9 (1) v (2) 11	10·3
19	4078	50	Bn	6 (3) v (1) 9	9·9
20	4079	32	Ca	8 (1) v (2) 9	9·9
22	4081	94	Ni	5 (5) v (2) 7	9·5
22	4081	156	Lp	=9	10·1
23	4082	75	Bg	9 (2) v (1) 11	10·5
23	4082	60	Kw	9−3, 14+5	10·5

Jan. 15, D, Difficult.
Feb. 9, Invisible.
Mar. 27, April 3, 6, June 18, T.
June 6, 8, 24, t.
June 6, Half-weight to second and third comparisons.
June 29, t.
July 1, 8, 25, T.
July 2, Difficult.
July 30, Half-weight to second comparison.
Aug. 22, Bg, About.
Aug. 27, Difficult.
Aug. 30, 16-in. OG.
Sept. 10, 16-in. OG.
Sept. 22, Lp, Difficult.
Sept. 24, Kw, T.
Sept. 26, 8-in. OG.
Oct. 8, 16, Ry, T.
Oct. 22, Ni, With 22, 9·6. Lp, 5-in. OG.
Oct. 23, Kw, T.

(782) R ARIETIS—*continued.*

1924					
Oct					
23	4082	50	Bn	6 (2) v (1) 9	9·9
23	4082	45	Br	=7	9·6
23	4082	34	Li	=7	9·6
24	4083	32	Ca	6 (2) v (3) 9	9·8
28	4087	100	Lp	=5	9·4*b*
30	4089	30	Ry	6−0·5, 7+2·5	9·5
30	4089	32	Ca	=5	9·4
Nov					
3	4093	55	Bg	4 (1) v (3) 5	8·9
3	4093	50	Bn	4 (4) v (1) 5	9·3
3	4093	30	Lp	4+2	8·5*b*
3	4093	60	D	4−3, 5+5	9·0
3	4093	45	Br	4−3, 5+3	9·1
3	4093	34	Li	=4	8·7
4	4094	22	Ni	4 (6) v (1) 5	9·3
6	4096	55	Bo	4 (1) v (6) 5	8·8
6	4096	20	Ry	g−2·5, 3−1, 4−1	8·9*b*
6	4096	34	Li	3 (9) v (1) 4	8·7
10	4100	32	Ca	4 (3) v (4) 5	9·0
12	4102	,,	,,	4+2	8·5
14	4104	40	D	4+5	8·2
15	4105	22	Ni	3 (2) v (1·5) 4	8·5
17	4107	30	Bg	P (5) v (1) 4	8·4
17	4107	50	Bn	4 (1) v (1) 5	9·1
17	4107	30	D	d (4) v (1) 4, 4+2	8·5
18	4108	,,	Ry	4+1	8·6
19	4109	34	Li	P (9) v (1) 3	8·2*b*
20	4110	32	Ca	4+2	8·5
22	4112	,,	,,	4+2	8·5
25	4115	22	Ni	d (5) v (1·5) 3	8·2
26	4116	30	Ry	4+1·5	8·6
27	4117	50	Bn	3−2, 4+1	8·6
27	4117	60	Kw	3−3, 4+4	8·5
27	4117	75	Lp	=3	8·3*b*
29	4119	62	Wf	4+2, 5+8	8·6*b*

Oct. 30, Nov. 6, Ry, t.
Nov. 3, Lp, 2-in. OG.
Nov. 6, Ry. Second comparison half-weight.
Nov. 17, D, 5[c].
Nov. 18, 26, Dec. 4, t.
Nov. 27, Kw, T.

1924					
Nov					
30	4120	30	D	d−6, 4+3	8·4*b*
30	4120	t	Bk	=4, 5+8	8·7
Dec					
1	4121	32	Ca	4+2	8·5
2	4122	t	Bk	2 (2) v (3) 4	7·6
3	4123	34	Li	2 (9) v (1) 3, P (8) v (2) 3	8·1*b*
4	4124	30	Ry	4+1	8·6*b*
5	4125	50	Bn	3+2	8·1
6	4126	55	Bo	4+4	8·3*c*
6	4126	,,	Bg	P (7) v (1) 4	8·5
9	4129	34	Li	P (8) v (2) 3	8·1*b*
9	4129	25	Bn	3+2	8·1
12	4132	32	Ca	4+2	8·5
14	4134	t	Bk	2 (9) v (1) 4, 4+3	8·5
14	4134	37	Wb	=3	8·3
14	4134	75	Lp	3+1	8·2*b*
14	4134	25	Bn	3+2	8·1
14	4134	55	Bg	4 (1) v (6) 5	8·8
15	4135	34	Li	P (8) v (2) 3	8·1*b*
18	4138	30	Ry	=4, 5+2·5	8·9
20	4140	55	Bg	4 (1) v (1) 5	9·1*b*
22	4142	22	Ni	4 (5) v (2) 5	9·2
22	4142	t	Bk	4−1, 5+5	8·9
22	4142	32	Ca	=4	8·7
23	4143	55	Bo	4+4	8·6*b*
24	4144	25	Bn	4 (3) v (1) 5	9·2
24	4144	40	D	4+1	8·6
26	4146	55	Bg	4 (2) v (1) 5	9·2
26	4146	22	Ni	4 (7) v (1·5) 5	9·3
27	4147	30	Ry	4−4·5, 5+0·5	9·3
28	4148	37	Wb	=5	9·4
28	4148	30	D	4−4, 5+4	9·1
28	4148	75	Lp	4 (2) v (2) 6	9·2*b*
28	4148	50	Bn	5+1	9·3
29	4149	55	Bg	=5, 6+2	9·4*b*
30	4150	50	Bn	5 (1) v (2) 6	9·5
30	4150	75	Lp	=5	9·4

Dec. 18, t.
Dec. 27, t. First comparison half-weight.

(1855) R AURIGÆ. (V. 1.)

H.D. 050953.

Date.	Julian Date.	Inst.	Observer.	Comparisons.	Deduced Mag.
1920					
Jan					
5	2329	70	Bo	=16	10·0*c*
8	2332	,,	,,	=14	10·3*b*
8	2332	90	Hw	=16	10·0
8	2332	157	Th	8+1	9·2
9	2333	60	D	8−3, 12+1	9·6*b*
9	2333	22	Ni	=20	10·5*b*
14	2338	70	Bo	=14	10·3
15	2339	160	Br	8−3, 12+1·5	9·6
15	2339	60	Tn	8−2	9·5
16	2340	90	Hw	8 (3) v (7) 14	9·6
19	2343	75	Bn	14 (2) v (1) 20	10·4
19	2343	90	Hw	=16	10·0
21	2345	55	Bo	=8	9·3

(1855) R AURIGÆ—*continued.*

20					
n					
1	2345	60	D	8−3, 12+1	9·6*b*
3	2347	94	Ni	8−1	9·4
4	2348	157	Th	8+2	9·1
6	2350	120	Br	=8	9·3
8	2352	60	D	8−1, 12+3	9·4
9	2353	23	Bo	=8	9·3*b*
0	2354	60	Tn	=8	9·3
b					
2	2357	94	Ni	4 (2) v (2) 8	9·1
3	2358	55	Bo	4 (4) v (1) 8	9·2
6	2361	90	Hw	8 (5) v (5) 10	9·4
7	2362	55	Bo	4 (3) v (1) 8	9·2
7	2362	94	Ni	=8	9·3
1	2366	120	Bn	=8	9·3
2	2367	55	Bo	4 (4) v (1) 8	9·2
3	2368	157	Th	8+3	9·0
6	2371	55	Bo	4 (1) v (3) 8	8·9
6	2371	60	D	=8	9·3
7	2372	160	Br	=8	9·3
7	2372	120	Bn	=8	9·3
7	2372	40	Hw	=8	9·3*b*
7	2372	94	Ni	4 (1) v (2) 8	9·0
9	2374	55	Bo	4 (1) v (3) 8	8·9
1	2376	60	Tn	4 (7) v (3) 8	9·1
3	2378	55	Bo	5 (3) v (2) 4	8·8
3	2378	60	D	8−1, 12+3	9·4
3	2378	94	Ni	4 (0·5) v (2) 8	8·9
4	2379	90	Hw	=8	9·3*b*
8	2383	55	Bo	=4	8·8
ar					
2	2386	60	Tn	=4	8·8
3	2387	55	Bo	3 (4) v (1) 4	8·7
3	2387	120	Bn	4 (3) v (1) 8	9·2
3	2387	40	Hw	4 (5) v (5) 8	9·1
7	2391	60	Tn	=4	8·8
8	2392	55	Bo	=5	8·7
8	2392	120	Bn	8+1	9·2
8	2392	157	Th	4 (1) v (1) 8	9·1
0	2394	60	Tn	=4	8·8
1	2395	,,	,,	4 (2) v (8) 8	8·9
1	2395	160	Br	4−0·5	8·9
2	2396	90	Hw	=8	9·3
2	2396	55	Bo	5 (1) v (3) 4	8·7
2	2396	120	Bn	4 (3) v (1) 8	9·2
2	2396	60	D	4−4, 8+2	9·2*b*
3	2397	,,	Tn	4 (2) v (8) 8	8·9
5	2399	,,	,,	4−1	8·9*b*
5	2399	30	D	4−4, 8+1	9·2
5	2399	79	Ma	8+2	9·1
5	2399	94	Ni	4 (2) v (2) 8	9·1
6	2400	55	Bo	3 (2) v (1) 4	8·6
7	2401	157	Th	4−1	8·9
7	2401	...	Tn	4−1	8·9
8	2402	120	Bn	4 (2) v (1) 8	9·1
8	2402	60	D	4−3, 8+2	9·1
9	2403	55	Bo	3 (9) v (1) 5, 3 (3) v (1) 4	8·7
0	2404	79	Ma	4 (3) v (7) 8	9·0
2	2406	120	Bn	5 (1) v (1) 4	8·8
2	2406	60	D	=4, 8+4	8·9
2	2406	40	Hw	3 (7) v (3) 4	8·6
2	2406	60	Tn	4+3	8·5
3	2407	160	Br	3−3, 4+4	8·4
3	2407	79	Ma	8+2·5	9·0

Mar. 17, Tn, 12½ in. spec.
Mar. 20, Reddish.
Mar. 23, Ma, Pale yellow.

1920					
Mar					
30	2414	50	Bo	3 (1) v (3) 4	8·3
30	2414	60	D	3−4, 4+2	8·6
31	2415	50	Bn	3 (4) v (1) 5	8·6
Apr					
1	2416	94	Ni	3 (5) v (4) 4	8·5
6	2421	23	Bo	2 (2) v (1) 3	8·0
6	2421	60	D	3−3, 4+4	8·4
11	2426	30	,,	3−1, 4+5	8·3
12	2427	75	Bn	3 (3) v (2) 5	8·5
13	2428	23	Bo	1 (19) v (1) 2	7·7
13	2428	79	Ma	3+5	7·7
15	2430	94	Ni	d+2	7·5
16	2431	45	Br	2+2, 3+5	7·6
16	2431	79	Ma	3+4	7·8
16	2431	60	D	3+2	8·0
16	2431	62	Th	3+2	8·0
19	2434	50	Ma	=2, 3+7	7·6
21	2436	30	Bn	d (3) v (2) 3	8·0
21	2436	22	Ni	d+1·5, 3+1·5	7·8
21	2436	62	Th	3+3	7·9
21	2436	79	Ma	1 (3) v (2) 5	7·4
22	2437	30	Tn	1 (7) v (3) 3	7·6*b*
27	2442	,,	Bn	d (3) v (1) 3	8·1
28	2443	50	Ma	1 (2) v (1) 3	7·5
29	2444	30	Bn	d (1) v (2) 3	7·9
29	2444	45	Br	2+3	7·5
30	2445	62	Th	3+5	7·7*b*
May					
3	2448	30	Bn	d (1) v (3) 3	7·8
3	2448	79	Ma	1 (2) v (1) 7, 3+8	7·9
4	2449	,,	,,	1 (2) v (1) 7, 3+7	8·0
7	2452	50	,,	1 (2) v (1) 7, 3+7	8·0
7	2452	30	Bn	d+1	7·6
9	2454	,,	,,	c−3·5, d+1, 2+2	7·6
9	2454	45	Br	2+2·5	7·6
9	2454	22	Ni	d+2	7·5
9	2454	50	Ma	1 (2) v (1) 7	8·2
12	2457	79	,,	1 (2) v (1) 7, 3+8	7·9
13	2458	30	Bn	d+4, 2+5	7·3
14	2459	50	Ma	1 (2) v (3) 7	7·4
16	2461	22	Ni	d+1·5	7·6
18	2463	50	Ma	1 (3) v (1) 7, 3+7	8·2
19	2464	30	Bn	c (1) v (2) d	7·4
22	2467	45	Br	2+3	7·5
23	2468	30	Bn	c (2) v (3) d, 2+4	7·4
23	2468	22	Ni	d+2	7·5
29	2474	30	Bn	c (1) v (1) d	7·5
June					
5	2481	,,	,,	c (3) v (1) d, 2+3	7·6
8	2484	,,	,,	c (3) v (1) d	7·6
8	2484	45	Br	1−10, 2+8, 3+8	7·2
20	2496	,,	,,	d+2, 3+4	7·6
July					
8	2514	94	Ni	3 (5) v (3) 4	8·6
16	2522	,,	,,	4−0·5	8·9
17	2523	160	Br	4+1	8·7
18	2524	50	Bn	=5, 4+1	8·7

April 13, Ma, Orange red.
April 15, With 22, 7·7.
April 16, Ma, Red.
April 19, About.
April 28, Very red.
May 3, Ma, Pale red.
May 4, Red.
May 7, 9, Ma, Very red.
May 12, 14, Pale red.

(1855) R AURIGÆ—*continued.*

1920 July 27	2533	94	Ni	4 (1·5) v (1·5) 8	9·1
Aug 4	2541	,,	,,	8 (2) v (2) 14	9·8*b*
6	2543	160	Br	8−4	9·7
26	2563	75	Bn	22+1	10·9*b*
Sept 6	2574	94	Ni	=26	11·5
7	2575	120	Bn	26−3	11·8*c*
8	2576	160	Bo	29 (1) v (1) 30	11·9*b*
8	2576	120	D	=31	12·1*c*
8	2576	90	Tn	26 (5) v (5) 41, 29, =31	12·0
10	2578	,,	Hw	22−6, 26−2	11·7*b*
10	2578	94	Ni	23 (3·5) v (1·5) 26	11·2
12	2580	120	Bn	26 (3) v (1) 27	11·8*b*
13	2581	150	Tn	26 (5) v (5) 41, =31	12·1
14	2582	160	Bo	29 (1) v (1) 30	11·9
19	2587	,,	,,	30 (1) v (3) 32	12·0
19	2587	,,	Br	26−4, 34+4	11·9
19	2587	120	Bn	=27	11·9
19	2587	94	Ni	26 (2) v (3) 29	11·6
19	2587	150	Tn	26 (7) v (3) 41	12·3
21	2589	,,	,,	26 (5) v (5) 41	12·1*b*
29	2597	55	Bo	29 (1) v (1) 30	11·9*c*
Oct 4	2602	160	,,	32 (1) v (1) 35	12·3
4	2602	94	Ni	29 (5) v (2) 37	12·2
6	2604	120	Br	=41	12·7
9	2607	160	Bo	41 (1) v (2) 43	12·7
12	2610	94	Ni	29 (4) v (2) 37	12·2
12	2610	150	Tn	=41	12·7*b*
14	2612	160	Bo	41 (3) v (1) 43	12·8
18	2616	150	Bn	43−2	13·0
19	2617	225	Bo	43 (1) v (3) 45	12·9
19	2617	94	Ni	29 (5) v (1) 37	12·3
29	2627	240	Br	=46	12·9
30	2628	160	Bo	43 (1) v (3) 45	12·9
Nov 1	2630	150	Bn	43−3	13·1
1	2630	94	Ni	=43	12·8
4	2633	160	Bo	45 (1) v (1) 46	13·3
4	2633	200	Bn	43, 4, =46	13·3*b*
8	2637	160	Bo	43 (3) v (1) 45	13·1
16	2645	240	Br	=46	13·3
16	2645	160	Bo	45 (1) v (1) 46	13·3
18	2647	94	Ni	43 (4) v (2) 46	13·2
20	2649	160	Bo	46 (1) v (3) 47	13·3
20	2649	183	Ma	43−2	13·0*b*
Dec 1	2660	150	Tn	=46	13·3
3	2662	,,	,,	=46	13·3
4	2663	94	Ni	=46	13·3
5	2664	150	Tn	<46	<13·3
8	2667	,,	,,	46−1	13·4
8	2667	240	Br	46−2	13·5
9	2668	200	Bn	=46	<13·3

Sept. 7, t.
Sept. 8, D, About. Very difficult.
Sept. 12, t.
Nov. 20, Ma, Just glimpsed.
Dec. 1, 3, Glimpsed.
Dec. 5, Invisible.
Dec. 8, Br, About. Glimpsed.
Dec. 9, Not seen.

1920 Dec 10	2669	183	Ma	43−2·5	13·
12	2671	160	Bo	46 (1) v (1) 47	13·
14	2673	150	Tn	<46	<13·
22	2681	,,	,,	<43	<12·
27	2686	,,	,,	<46	<13·
31	2690	240	Br	46−3	13·
1921 Jan 1	2691	150	Tn	<46	<13·
2	2692	183	Ma	43−5	13·
4	2694	150	Tn	<46	<13·
7	2697	,,	,,	<46	<13·
8	2698	160	Bo	46 (1) v (1) 47	13·
9	2699	94	Ni	46−1	13·
13	2703	150	Tn	<46	<13·
13	2703	120	Br	46−2	13·
16	2706	160	Bo	<45	<13·
16	2706	94	Ni	=46	13·
16	2706	150	Tn	<46	<13·
26	2716	,,	,,	46−1	13·
27	2717	160	Bo	46 (1) v (1) 47	13·
31	2721	,,	,,	46 (1) v (3) 47	13·
Feb 2	2723	150	Tn	<46	<13·
3	2724	120	Br	=46	13·
5	2726	160	Bo	46 (1) v (3) 47	13·
8	2729	150	Tn	43 (5) v (5) 46	13·
10	2731	94	Ni	43 (3) v (2) 46	13·
10	2731	150	Tn	43−1	12·
11	2732	,,	,,	43−2	13·
14	2735	,,	Bn	43−3	13·
19	2740	160	Bo	41 (1) v (1) 43	12·
20	2741	94	Ni	43−2·5	13·
24	2745	160	Bo	=41	12·
25	2746	120	Br	43−1	12·
25	2746	150	Tn	=41	12·
26	2747	120	Bn	41 (2) v (1) 43	12·
27	2748	183	Ma	41+1, 43+3	12·
Mar 2	2751	,,	,,	41+2	12·
2	2751	160	Bo	37 (1) v (1) 40	12·
2	2751	90	Hw	=34	12·
2	2751	94	Ni	37 (3) v (1) 43	12·
2	2751	150	Tn	=37	12·
7	2756	183	Ma	=31	12·
10	2759	160	Bo	31 (3) v (1) 34	12·
10	2759	120	Bn	41+2	12·
10	2759	94	Ni	37 (1·5) v (2·5) 43	12·
14	2763	183	Ma	28 (1) v (1) 27	11·
15	2764	55	Bo	29 (3) v (1) 30	11·
18	2767	79	Ma	26−2, =27	11·
20	2769	160	Br	=26	11·
21	2770	55	Bo	26 (1) v (3) 29	11·
24	2773	79	Ma	27+1·5, 31+1·5	11·
24	2773	90	Hw	26 (5) v (5) 31	11·
25	2774	120	Bn	26 (3) v (1) 27	11·
25	2774	94	Ni	26 (3) v (2) 29	11·

Dec. 10, Glimpsed.
Dec. 14, Invisible.
Dec. 31, About.
Jan. 1, 4, 7, 13, Tn, Invisible.
Jan. 13, Br, Difficult.
Jan. 16, Tn, Invisible.
Feb. 2, Invisible. Foggy.
Mar. 7, About.

(1855) R AURIGÆ—*continued.*

1921 Mar 26	2775	79	Ma	14 (3) v (1) 27	11·5
29	2778	140	Bo	26 (1) v (3) 29	11·6
30	2779	79	Ma	26+1	11·4
31	2780	120	Bn	24−3, =26	11·5*b*
Apr 1	2781	94	Ni	26 (1) v (4) 29	11·6
2	2782	55	Bo	23 (3) v (1) 25	11·0
3	2783	60	D	<26	<11·5
3	2783	79	Ma	26+1, =27	11·7
4	2784	83	Li	26 (2) v (8) 37	11·7*b*
6	2786	85	Bn	26 (1) v (1) 27	11·7
7	2787	55	Bo	20 (2) v (3) 22	10·7
7	2787	160	Br	25−1, 26+2	11·3
7	2787	83	Li	25 (5) v (5) 27, 26 (4) v (6) 37	11·7
7	2787	94	Ni	26 (2) v (3) 29	11·6
7	2787	150	Tn	16 (3) v (7) 26	10·5*b*
8	2788	79	Ma	14−1	10·4
10	2790	,,	,,	=14	10·3
10	2790	150	Tn	23 (5) v (5) 25	10·9
12	2792	55	Bo	20 (1) v (3) 22	10·6
18	2798	150	Tn	=23	10·7
18	2798	94	Ni	=23	10·7
18	2798	55	Bo	16 (2) v (1) 18	10·2
27	2807	94	Ni	23 (4) v (2) 26	11·2
28	2808	160	Br	=23	10·7
28	2808	120	Bn	26 (1) v (3) 27	11·6
28	2808	83	Li	8 (5) v (5) 23	10·0
29	2809	79	Ma	=23	10·7
29	2809	55	Bo	16 (1) v (3) 19	10·1
May 1	2811	83	Li	14−1, 26+11	10·4
1	2811	120	Bn	26+0·5	11·4
8	2818	,,	,,	22 (2) v (1) 24	11·2
8	2818	160	Br	12−6, 23+6	10·2
10	2820	79	Ma	8−4, 14+1	9·9
12	2822	94	Ni	20 (2) v (1) 23	10·6
21	2831	120	Bn	14 (1) v (1) 20	10·4
23	2833	94	Ni	14−1	10·4
29	2839	,,	,,	14 (2) v (2) 20	10·4
June 1	2842	160	Br	8−3, 14+6	9·6
6	2847	94	Ni	14 (2) v (1) 20	10·4
29	2870	50	Bn	12 (1) v (2) 14	9·9
July 2	2873	94	Ni	4 (4) v (0·5) 8	9·2
7	2878	120	Br	8−3	9·6
8	2879	94	Ni	4 (2) v (2) 8	9·1
9	2880	120	Bn	=8	9·3
30	2901	60	D	3−4, 4+2	8·6
Aug 8	2910	120	Br	3−2	8·4
11	2913	60	D	3−2·5, 4+3·5	8·4
15	2917	94	Ni	3 (3) v (5) 4	8·4*b*
24	2926	55	Bo	3 (1) v (7) 4	8·2
26	2928	94	Ni	3 (5) v (4) 4	8·5
26	2928	60	D	3−5, 4+1	8·7*b*
28	2930	,,	,,	3−4, 4+1	8·6
30	2932	,,	,,	=4	8·8
30	2932	45	Br	=3	8·2
31	2933	55	Bo	3 (1) v (5) 4	8·3
1921 Sept 2	2935	60	D	=4	8·8
3	2936	75	Bn	5 (1) v (3) 8	8·9
5	2938	55	Bo	3 (2) v (3) 5	8·4
6	2939	60	D	4−1, 8+4	8·9
7	2940	75	Bn	5 (1) v (2) 8	8·9
10	2943	,,	,,	5 (1) v (1) 8	9·0
10	2943	45	Br	3−2	8·4
14	2947	60	D	4−2, 8+3	9·0
14	2947	94	Ni	3 (6) v (3) 4	8·6
21	2954	55	Bo	4 (1) v (3) 8	8·9
21	2954	90	Hw	=8	9·3*b*
23	2956	60	D	4−4, 8+2	9·2
24	2957	50	Bn	5 (3) v (1) 8	9·1
25	2958	45	Br	3−4, 4+3	8·5
25	2958	94	Ni	=4	8·8
27	2960	60	D	=8	9·3
27	2960	90	Hw	=8	9·3
29	2962	50	Bn	5 (3) v (1) 8	9·1
Oct 1	2964	,,	,,	5 (3) v (1) 8	9·1
4	2967	,,	,,	5 (3) v (1) 8	9·1
5	2968	83	Li	4 (7) v (3) 8	9·1
6	2969	55	Bo	4 (3) v (2) 8	9·1
6	2969	90	Hw	=10	9·5
9	2972	83	Li	4 (4) v (6) 8	9·0
10	2973	94	Ni	4 (2·5) v (1) 8	9·1
14	2977	45	Br	4−2, 8+4	9·0
15	2978	160	Bo	8 (1) v (4) 10	9·3*b*
18	2981	90	Hw	10 (5) v (5) 16	9·8
19	2982	150	Tn	8−1	9·4
21	2984	55	Bo	10 (1) v (2) 12	9·6*b*
23	2986	150	Tn	8−1	9·4
23	2986	120	Bn	8−0·5	9·3
23	2986	83	Li	10 (7) v (3) 14	10·0
25	2988	160	Br	8−4	9·7
29	2992	55	Bo	10 (1) v (1) 12	9·6
Nov 6	3000	160	Br	23+3	10·4
6	3000	120	Bn	20 (2) v (1) 23	10·6
6	3000	83	Li	16 (3) v (7) 26	10·5
7	3001	150	Tn	8−2	9·5
8	3002	94	Ni	8 (4) v (2) 14	9·9
10	3004	120	Bn	23+0·5	10·6
11	3005	55	Bo	12 (1) v (2) 16	9·8
17	3011	,,	,,	16 (3) v (1) 20	10·3
22	3016	,,	,,	14 (3) v (1) 20	10·4
22	3016	94	Ni	23+5	10·2
23	3017	79	Ma	8−9, 16−2	10·2*b*
25	3019	140	Bo	20 (3) v (2) 23	10·6*b*
26	3020	120	Bn	=24	11·2
30	3024	94	Ni	23 (1·5) v (4) 26	10·9
Dec 3	3027	150	Tn	26+2	11·3
3	3027	160	Br	23−2, 25+2	10·9
3	3027	83	Li	25 (7) v (3) 31, 26 (5) v (5) 37	11·9
10	3034	,,	,,	<26	<11·5*b*
17	3041	55	Bo	26 (1) v (3) 28	11·6
17	3041	90	Hw	22 (8) 26 (2) v	11·6*b*
20	3044	94	Ni	23 (7) v (1) 26	11·4
22	3046	120	Bn	26 (1) v (3) 27	11·6
23	3047	160	Br	26−4, 34+4	11·9
24	3048	140	Bo	26 (3) v (1) 28	11·8
28	3052	94	Ni	26 (2) v (3) 29	11·6
29	3053	183	Ma	=28, =27	11·9
29	3053	85	Bn	26 (4) v (1) 27	11·8

Mar. 26, Red.
April 8, Dull red.
April 10, Ma, About.
April 28, Li, Difficult.
May 10, Reddish.

(1855) R AURIGÆ—*continued.*

1922 Jan					
3	3058	160	Br	=34	12·3
4	3059	79	Ma	28+2	11·7
4	3059	60	D	<26	<11·5
16	3071	90	Hw	<26	<11·5
17	3072	120	Bn	=41	12·7*b*
22	3077	94	Ni	37 (2) v (3) 43	12·5
Feb					
17	3103	130	Ma	43+2	12·6
17	3103	120	Bn	=43	12·8*b*
18	3104	,,	Br	43−2	13·0
19	3105	130	Ma	43+2	12·6
20	3106	83	Li	<43	<12·8
24	3110	130	Ma	43+1	12·7
26	3112	94	Ni	43+1	12·7
26	3112	83	Li	<43	<12·8
Mar					
4	3118	120	Br	43−2, 46+2	13·1
9	3123	130	Ma	43−2	13·0
17	3131	94	Ni	43 (3) v (1) 46	13·2*b*
18	3132	130	Ma	43−2	13·0*b*
20	3134	,,	,,	43−3	13·1
21	3135	150	Bn	<43	<12·8
23	3137	130	Ma	43−2, 46+3	13·0
25	3139	120	Br	46−1	13·4
28	3142	150	Bn	43 (3) v (1) 46	13·2
28	3142	130	Ma	=43	12·8*b*
29	3143	94	Ni	46 (2) v (4) s	13·4
Apr					
14	3159	,,	,,	=46	13·3
17	3162	130	Ma	<43	<12·8*b*
19	3164	,,	,,	43−5	13·3
19	3164	85	Bn	<43	<12·8
20	3165	94	Ni	46+2	13·1
29	3174	120	Br	=46	13·3
May					
4	3179	150	Bn	<43	<12·8
14	3189	,,	,,	43 (2) v (1) 46	13·2
19	3194	,,	,,	43−2	13·0*b*
23	3198	94	Ni	43+1·5	12·7
25	3200	240	Br	43+2	12·6
28	3203	94	Ni	=43	12·8
June					
26	3232	150	Wf	20−3, 22+1·5	10·8*b*
July					
12	3248	94	Ni	=14	10·3
18	3254	160	Br	8−6, 14+4	9·9
26	3262	150	Wf	8−3, 14+5	9·7
Aug					
7	3274	94	Ni	4 (1) v (1) 8	9·1
15	3282	30	D	14+2	10·1*b*
16	3283	150	Wf	8−3, 12+2	9·6
19	3286	160	Br	12 ·1	9·8
21	3288	94	Ni	8 (4) v (1) 14	10·1
23	3290	150	Wf	4−4, 8+1	9·2
28	3295	94	Ni	4+2·5	8·6

Jan. 4, Ma, Reddish. D, Variable suspected.
Jan. 17, t.
Mar. 9, Glimpsed.
Mar. 18, Difficult. Just glimpsed.
Mar. 20, Faintly glimpsed.
Mar. 25, Difficult.
Mar. 28, Ma, About.
April 19, Ma, Just glimpsed. Bn, Not seen.
April 29, About.
May 4, Not seen.
Aug. 15, 3-in. OG.
Aug. 23, Reddish.

1922 Sept					
3	3301	94	Ni	4 (2) v (1) 8	9·1
3	3301	62	D	8−4, 14+2	9·9
9	3307	75	Bn	=10	9·5
10	3308	94	Ni	4 (2·5) v (1·5) 8	9·1
11	3309	90	Hw	8 (5) v (5) 10	9·4
16	3314	157	Wf	4−2, 8+2	9·1
18	3316	40	Hw	=8	9·3
18	3316	94	Ni	4 (2) v (1) 8	9·1
23	3321	157	Wf	=8	9·3
29	3327	62	D	4−4, 8+2	9·2
29	3327	50	Bn	5 (2) v (1) 8	9·1
29	3327	160	Br	4−2, 8+3	9·0
Oct					
6	3334	94	Ni	4−2	9·0
6	3334	50	Bn	5 (1) v (2) 8	8·9
7	3335	90	Hw	=8	9·3
12	2340	50	Bn	5+1	8·6
12	3340	34	Li	3 (5) v (5) 4	8·5
13	3341	,,	,,	3 (6) v (4) 4	8·6
13	3341	31	D	3−4, 4+2	8·6
13	3341	62	Wf	3−2, 4+4	8·4
15	3343	94	Ni	3 (8) v (2) 4	8·7
15	3343	50	Bn	=5, 4+1	8·7
15	3343	34	Li	3 (5) v (5) 4	8·5
16	3344	,,	,,	3 (2) v (8) 4	8·3
16	3344	40	Hw	=4	8·8
19	3347	32	Ca	3 (5) v (2) 4	8·6
20	3348	34	Li	3 (1) v (9) 4	8·2
22	3350	50	Bn	3 (1) v (2) 5	8·3
22	3350	31	D	3−5, 4+3	8·6
22	3350	94	Ni	3 (6) v (4) 4	8·6
23	3351	34	Li	=3	8·2
25	3353	50	Bn	3+1	8·1
26	3354	34	Li	2 (9) v (1) 3	8·1
27	3355	,,	,,	1 (9) v (1) 2	7·6
27	3355	45	Br	=3	8·2
28	3356	50	Bn	d (3) v (1) 3	8·1
28	3356	34	Li	1 (8) v (2) 2	7·5
30	3358	25	Bn	d (2) v (1) 3	8·0
Nov					
1	3360	34	Li	1 (5) v (5) 2	7·0
4	3363	50	Bn	d+2, 2+3	7·5
6	3365	34	Li	1 (8) v (2) 2	7·5
10	3369	,,	,,	1 (4) v (6) 2	6·8
11	3370	45	Br	d+2, 3+6	7·5
12	3371	94	Ni	=3	8·2
13	3372	50	Bn	d+2, 2+3	7·5
14	3373	32	Ca	1 (12) v (4) 2	7·4
15	3374	30	Bn	d+3	7·4
15	3374	40	Hw	v (4) 3 (6) 8	7·4
18	3377	50	Bn	d+2, 2+4	7·5
24	3383	,,	,,	d+2, 2+4	7·5
24	3383	45	Br	d+1	7·6
24	3383	32	Ca	1 (12) v (4) 2	7·4
24	3383	79	Ma	3+2	8·0
26	3385	94	Ni	d (7) v (1) 3	8·1
Dec					
7	3396	32	Ca	2 (2) v (2) 3	8·0
8	3397	50	Bn	d (3) v (1) 3	8·1
11	3400	34	Li	1 (8) v (2) 2	7·5
14	3403	94	Ni	=3	8·2
18	3407	50	Bn	d (2) v (1) 3	8·0
19	3408	45	Br	3+1	8·1
20	3409	32	Ca	=3	8·2

Nov. 12, With 22, 8·3.
Nov. 24, Ma, Pale orange red.

(1855) R AURIGÆ—*continued.*

1922					
Dec					
20	3409	75	Pr	3+2	8·0
20	3409	62	D	3−4, 4+2	8·6
21	3410	94	Ni	3 (4) v (4) 4	8·5
22	3411	75	Pr	2−1, 3+3	7·9
23	3412	30	Bn	2 (2) v (1) 3	8·0
26	3415	40	Hw	=3	8·2
26	3415	75	Pr	3+2	8·0*b*
30	3419	94	Ni	3 (6) v (4) 4	8·6
1923					
Jan					
3	3423	34	Li	1 (8) v (2) 2	7·5
4	3424	75	Pr	3+2	8·0*b*
6	3426	34	Li	=3	8·2
8	3428	...	Sa	1−20, d−10, 3−2, 4+4, 8+12	8·4
8	3428	94	Ni	3 (7) v (3) 4	8·6
9	3429	75	Pr	3+2	8·0
10	3430	,,	Bn	3 (5) v (2) 5	8·6
12	3432	79	Ma	4−2	9·0
13	3433	62	Wf	3−1, 4+5	8·3
14	3434	75	Pr	=3, 4+6	8·2
14	3434	94	Ni	3 (6) v (1·5) 4	8·7
15	3435	75	Bn	5−1, =4	8·8
18	3438	32	Ca	4 (2) v (4) 9	9·0
18	3438	34	Li	3 (4) v (6) 4	8·4*b*
20	3440	,,	,,	3 (2) v (8) 4	8·3
20	3440	45	Br	3−4, 4+2	8·6
20	3440	75	Bn	4 (3) v (1) 9	9·3
20	3440	40	Hw	=4	8·8
21	3441	...	Sa	d−12, 3−3, =4, 8+10, 12+10	8·6
23	3443	62	Wf	3−4, 4+1	8·6
23	3443	,,	D	4−3, 8+1	9·2
Feb					
4	3455	50	Bn	4 (1) v (1) 8	9·1
5	3456	160	Br	=8	9·3
5	3456	34	Li	3 (6) v (4) 4	8·6
5	3456	75	Pr	3−5, 4+1	8·7
6	3457	...	Sa	3−8, =4, 8+5 12+5	8·9
7	3458	157	Wf	4−2, 8+2	9·1
7	3458	80	Ca	4 (2) v (2) 8	9·1
13	3464	94	Ni	4+0·5	8·8
21	3472	75	Pr	3−6, 4+1	8·7
26	3477	94	Ni	4 (2) v (1·5) 8	9·1
Mar					
5	3484	34	Li	5 (5) v (5) 6	9·0
5	3484	79	Ma	8−2	9·5
5	3484	...	Sa	=7, =8, =9	9·3
9	3488	80	Ca	12 (3) v (2) 14	10·0
15	3494	94	Ni	14 (2) v (2) 20	10·4
17	3496	...	Sa	8−10, 12−7, 23+3	10·4
17	3496	90	Hw	14 (5) v (5) 22	10·7
17	3496	50	Bn	14 (3) v (1) 20	10·4
21	3500	94	Ni	=20	10·5
24	3503	...	Sa	=20, 22+3, 23+5	10·5
26	3505	40	Hw	22 (5) v (5) 26	11·3
Apr					
2	3512	94	Ni	20 (1·5) v (2·5) 23	10·5
4	3514	75	Pr	16−3, =14	10·3*b*
8	3518	94	Li	23 (4) v (6) 26	11·0
8	3518	62	Wf	14 (3) v (2) 23	10·5
1923					
Apr					
9	3519	120	Bn	26+1	11·4
10	3520	94	Ni	23 (5) v (2) 26	11·3
14	3524	,,	Li	23 (5) v (5) 25	10·9
14	3524	75	Pr	14−4, 23+2	10·6
15	3525	150	Wf	16−5, 23+2	10·5*b*
19	3529	94	Li	23 (5) v (5) 25	10·9
19	3529	79	Ma	=23	10·7
20	3530	160	Br	=26	11·5
20	3530	120	Bn	=27	11·9*b*
23	3533	...	Sa	23−5, =26	11·3
26	3536	79	Ma	23 (1) v (3) 25	10·8
May					
3	3543	94	Li	26 (5) v (5) 28	11·7*b*
3	3543	...	Sa	=29	11·9
4	3544	94	Ni	26 (4) v (2) 29	11·7
5	3545	120	Br	=31	12·1
6	3546	150	Wf	26−3, 31+4	11·8
12	3552	...	Sa	25−5, =29, =27	11·8
18	3558	94	Ni	29+0·5	11·8
20	3560	62	Wf	=31, 34+3	12·1
June					
3	3574	150	,,	31−2, 34+1	12·3*b*
14	3585	157	,,	43−1	12·9*b*
July					
8	3609	231	,,	<43	<12·8*b*
12	3613	94	Ni	43−1	12·9
19	3620	157	Wf	46−1, =47	13·4
Aug					
4	3636	94	Ni	43 (4) v (1) 46	13·2*b*
5	3637	OG	Ph	46−4	13·7*b*
6	3638	157	Wf	=46	13·3*b*
9	3641	240	Br	43−3	13·1*b*
11	3643	...	Sa	<43	<12·8
11	3643	150	Bn	<43	<12·8
12	3644	157	Wf	46−2	13·5*b*
28	3660	...	Sa	<41	<12·7
Sept					
2	3665	94	Ni	43−1	12·9
5	3668	150	Wf	43−2, 46+3	13·0
6	3669	200	Bn	43 (3) v (1) 46	13·2
8	3671	120	Br	43−2, 46+2	13·1
8	3671	OG	Ph	43 (2) v (1) 46, =44	13·2
8	3671	94	Ni	43+0·5	12·8
12	3675	OG	Ph	=46	13·3
13	3676	300	Wf	43−2, 46+3	13·0
15	3678	...	Sa	=46	13·3
15	3678	120	Br	43−2	13·0
29	3692	...	Sa	=43	12·8
30	3693	OG	Ph	34−2, =39, =41	12·6
30	3693	157	Wf	37 (1) v (1) 41	12·5
30	3693	94	Ni	29 (2) v (2) 37	12·1*b*
Oct					
1	3694	120	Br	43+1	12·7
4	3697	90	Hw	22 (5) 26 (5) v	11·9
9	3702	160	Br	25−2	11·3
9	3702	150	Wf	26−2, 28+2	11·7
11	3704	...	Sa	=34	12·3
12	3705	94	Ni	26 (3) v (1) 29	11·8

Dec. 26, Pr, Deep orange.
Jan 4, Orange.
Jan. 12, Red.
Mar. 5, Ma, Pale yellow.

April 9, t.
April 19, Ma, Dull red.
April 20, Bn, t.
May 5, About.
Aug. 6, 12, Difficult.
Aug. 9, About. Difficult.
Aug. 11, Sa, Not visible. Bn, Glimpsed.
Aug. 28, Not visible.

(1855) R AURIGÆ—*continued.*

1923 Oct					
13	3706	60	Ga	26− 5, −29	11·9
13	3706	80	Ca	<33	<12·3
15	3708	90	Hw	−26	11·5*b*
16	3709	OG	Ph	37 (1) v (1) 41	12·5*b*
23	3716	...	Sa	23, 25	10·9
25	3718	94	Ni	23 (2) v (3) 26	11·0
30	3723	150	Wf	14−5, 23+3	10·6
Nov					
2	3726	120	D	16 (1) v (2) 26, 16−4	10·5*b*
4	3728	80	Ca	23 (1) v (1) 24	10·9
5	3729	160	Br	=23	10·7
7	3731	120	Bn	24−2, =26	11·4
7	3731	...	Sa	23−2, 26+2	11·1
8	3732	94	Ni	23 (2) v (4) 26	10·9
9	3733	32	Ca	23 (1) v (1) 24	10·9
10	3734	120	D	26	11·2*b*
10	3734	40	Hw	22	11·0
16	3740	94	Ni	20 (2) v (1) 23	10·6
24	3748	...	Sa	20−0, 23	1, 25	3	10·8
27	3751	80	Ca	21 (4) v (1) 23	10·7
30	3754	60	D	14 (3) v (2) 20, 26	5	11·0
30	3754	90	Hw	22 (3) v (7) 26	11·2*b*
Dec					
3	3757	50	Bn	23 (1) v (1) 24	10·9
5	3759	80	Ca	12 (5) v (2) 20	10·2
6	3760	160	Br	14−2, 23	2	10·5*b*
6	3760	...	Sa	12−3, 14−1, 23	5, 25	6	10·3
9	3763	60	D	−16	10·0
11	3765	32	Ca	12 (2) v (3) 14	9·9
11	3765	94	Ni	−20, 23	1	10·5
12	3766	150	Wf	16−1, 20+2	10·2
15	3769	120	Bn	20 (1) v (1) 23	10·6
16	3770	80	Ca	12 (2) v (3) 14	9·9
19	3773	64	Sa	8−5, 16−1, −14, 23	8	10·0
28	3782	90	,,	8−4, −12, −16, 23	8	9·8
30	3784	60	D	−16	10·0*b*
31	3785	80	Ca	12−2	9·9
1924 Jan					
3	3788	94	Ni	8	1	9·2
3	3788	160	Br	8−4, 12	2	9·6
3	3788	34	Sa	12−2, −16, −14	10·1
5	3790	40	Hw	16 (5) v (5) 22	10·5*b*
5	3790	60	D	−4	10·3*b*
6	3791	120	Bn	14 (1) v (1) 20	10·4
12	3797	94	Ni	4 (3) v (1) 8	9·2
15	3800	120	D	6−4	9·7
20	3805	34	Sa	5−3, 4−6, 8+4, 9+2, 10+1	9·2
25	3810	40	Hw	=8	9·3*b*
25	3810	160	Br	=4	8·8
27	3812	50	Bn	4 (1) v (1) 8	9·1
27	3812	120	D	6−1	9·4
28	3813	45	Br	3+1	8·1
29	3814	34	Sa	3−5, 5+2, 4+3	8·6
29	3814	32	Ca	4 (4) v (2) 9	9·2
Feb					
1	3817	94	Ni	4 (0·5) v (3) 8	8·9
1	3817	120	D	6−0·5	9·3
1	3817	40	Hw	=8	9·3

Oct. 13, Ga, T. Ca, Invisible.
Nov. 2, 10, D, Difficult.
Jan. 5, D, About.

1924 Feb					
1	3817	50	Bn	4 (1) v (1) 8	9·1
1	3817	150	Wf	8−2, =10	9·5
8	3824	157	,,	=4, 8+4	8·9
8	3824	120	D	4−2, 6+4	9·0
9	3825	32	Ca	=4	8·8
14	3830	60	D	3−5, 4+1	8·7
14	3830	94	Ni	3 (6) v (4) 4	8·6
16	3832	50	Bn	3 (2) v (1) 5	8·5
16	3832	34	Sa	=3	8·2
20	3836	32	Ca	=3	8·2
20	3836	62	Wf	v (2) 3 (8) 4	8·0
23	3839	40	D	3−3, 4+4	8·4
28	3844	F	Wf	2 (1) v (1) 3	8·0
29	3845	94	Ni	3+1	8·1
Mar					
1	3846	34	Sa	2+1, 3+1, 4+5	8·0
3	3848	32	Ca	2 (3) v (1) 3	8·1
4	3849	50	Bn	d (3) v (1) 3	8·1
4	3849	40	D	3−0·5, 4+5	8·3
5	3850	F	Wf	2 (2) v (3) 3	7·9
6	3851	94	Ni	3+1	8·1
6	3851	32	Ca	2 (1) v (3) 3	7·9
7	3852	50	Bn	d (2) v (1) 3	8·0
8	3853	40	D	=3	8·2
9	3854	32	Ca	2 (2) v (1) 3	8·0
10	3855	34	Sa	2+1, 3+3	7·8
11	3856	40	D	3+1	8·1
11	3856	79	Ma	3 (1) v (4) 4, 3−2	8·3
12	3857	30	Bn	d (3) v (1) 3	8·1
13	3858	34	Sa	2−1, 3+2, 5+6	8·0
13	3858	18	Sg	3−1	8·3
14	3859	40	D	3+1	8·1
16	3861	94	Ni	3 (1) v (6) 4	8·3
19	3864	50	Bn	d (4) v (1) 3	8·1
20	3865	34	Sa	=2, 3+3, 4+6	8·0
23	3868	32	Ca	3 (2) v (3) 5	8·4
23	3868	60	D	3−3, 4+2	8·5
24	3869	40	Hw	3 (7) v (3) 8	8·9
29	3874	94	Ni	3 (5) v (5) 4	8·5
29	3874	50	Bn	3+1	8·1
29	3874	79	Ma	3 (2) v (1) 4	8·6
30	3875	60	D	3−3, 4+2	8·5
Apr					
4	3880	50	Bn	3 (1) v (1) 5	8·4
4	3880	32	Ca	3 (3) v (3) 4, 5+2	8·5
5	3881	40	Hw	3 (5) v (5) 4	8·5
5	3881	79	Ma	3+2, 4+2·5	8·3
5	3881	80	D	3−3, 4+2	8·5
5	3881	18	Sg	=3	8·2
7	3883	50	Bn	3 (1) v (1) 5	8·4
7	3883	34	Sa	2−6, 3+2, 4+5	8·2
7	3883	62	Wf	3−2, 4+4	8·4
11	3887	18	Sg	=3	8·2
14	3890	34	Sa	3−3, 4+3	8·5
20	3896	50	Bn	3 (5) v (1) 5	8·6
21	3897	94	Ni	3 (7) v (2) 4	8·7
23	3899	62	Wf	3−3, 4+3	8·5
24	3900	32	Ca	5 (4) v (2) 8	9·1

Feb. 14, D, 5°.
Mar. 8, 8°.
Mar. 11, D, 7°. Ma, Pale red.
Mar. 23, D, 6°.
Mar. 29, Ma, Reddish.
Mar. 30, 7°.
April 5, Ma, Very difficult and doubtful.
April 21, Unsteady. Difficult.

(1855) R AURIGÆ—*continued.*

24					
r					
5	3902	64	Sa	4−1, 8+4, =9, 12+3	9·2
9	3905	62	Wf	=4, 8+4·5	8·8
y					
5	3911	120	Bn	4 (2) v (1) 8	9·1
5	3911	79	Ma	4 (4) v (1) 8, 8+2	9·2
5	3911	157	Wf	4−2, 8+2	9·1
5	3911	94	Ni	=4	8·8
7	3913	60	D	6+1	9·2
7	3913	134	Sa	4−5, 8+1	9·3
5	3917	150	Wf	=8	9·3
3	3919	60	D	6−4	9·7
5	3922	94	Ni	4 (3) v (1) 8	9·2
5	3922	134	Sa	8−2, 9−1, =12	9·6
5	3922	120	Bn	10 (2) v (1) 12	9·7
9	3926	150	Wf	8−2, 12+2	9·5
4	3930	94	Ni	8 (3) v (1) 14	10·0
7	3933	120	Bn	14 (3) v (1) 20	10·4
9	3935	150	Wf	=16, =14	10·1*b*
nc					
7	3944	,,	,,	14−2, =20	10·5
8	3945	94	Ni	14 (3) v (1) 20	10·4*b*
2	3959	150	Wf	16−5, 23+3	10·4
7	3964	,,	,,	20−3, 25+4	10·7
y					
3	3970	,,	,,	23−3, 26+2	11·1
9	3973	94	Ni	23 (4·5) v (1·5) 26	11·3
8	3975	150	Wf	23−5, =26	11·3
2	3978	50	Bn	23 (4) v (1) 22	11·0
2	3978	94	Ni	23 (5) v (1·5) 26	11·3
3	3989	,,	,,	26 (3) v (1) 29	11·8
2	3989	150	Wf	=26	11·4
7	3994	,,	,,	=37, 37+1	12·2*b*
g					
4	4002	157	,,	=31, 34+2	12·1
7	4005	120	Bn	27 (2) v (1) 31	12·1
2	4020	157	Wf	=37, 41+2	12·4
5	4023	134	Sa	<36	<12·4*b*
	4029	157	Wf	=42, 43+1	12·7
ot					
	4030	134	Sa	=43	12·8

May 5, Ma, Dull red.
May 29, June 8, Difficult.
Aug. 25, Sept. 8, Not visible.

1924					
Sept					
8	4037	134	Sa	<43	<12·8
14	4043	231	Wf	43−2	13·0*b*
22	4051	120	D	<43	<12·8
27	4056	157	Wf	43−3, 45+1	13·1
27	4056	120	Br	43−2, 46+3	13·0
27	4056	134	Sa	<43	<12·8
Oct					
5	4064	157	Wf	43−2, 45+2	13·0
6	4065	206	Sa	<43	<12·8
23	4082	200	Bn	43 (4) v (1) 46	13·2*b*
23	4082	120	Br	46+1	13·2
23	4082	94	Ni	43 (5) v (2) 46	13·2
23	4082	M	Ph	45 (1) v (1) 46	13·3
31	4090	134	Sa	<46	<13·3
Nov					
3	4093	120	Br	=46	13·3
3	4093	150	Bn	46+1	13·2
4	4094	94	Ni	43 (4) v (1) 46	13·2
15	4105	,,	,,	43 (2) v (3) 46	13·0
17	4107	134	Sa	<43	<12·8
30	4120	200	Bn	43 (3) v (1) 46	13·2
30	4120	193	Li	43 (5) v (5) 46	13·1*b*
30	4120	94	Ni	43 (2) v (4) 46	13·0
Dec					
9	4129	193	Li	<43	<12·8*b*
13	4133	,,	,,	43 (3) v (7) 46	13·0*b*
13	4133	134	Sa	<41	<12·7
14	4134	150	Bn	43−3	13·1*b*
19	4139	90	Sa	41−1, 43+1	12·8
22	4142	60	D	<41, =43	12·8*b*
22	4142	94	Ni	=43	12·8
26	4146	200	Bn	43 (1) v (1) 46	13·1
27	4147	90	Sa	43−2	13·0
28	4148	60	D	...	12·9*b*
30	4150	94	Ni	37 (4) v (1) 43	12·7
30	4150	M	Ph	=41	12·7

Sept. 27, Sa, Oct. 6, 31, Not visible.
Oct. 23, Ni, Unsteady.
Nov. 17, Suspected only.
Nov. 30, Li, Dec. 9, Difficult.
Dec. 13, Sa, Not visible.
Dec. 22, D, Variable suspected.
Dec. 28, Variable just seen. 43 held.

(2186) X AURIGÆ. (V. 7.)

H.D. 060450.

Date.	Julian Date.	Inst.	Observer.	Comparisons.	Deduced Mag.
1920					
Jan					
1	2325	90	Bh	2+1, 5+3	8·4
5	2329	45	,,	1−1, 3+1, 5+2	8·5
5	2329	94	Ni	2 (2) v (2) 5	8·6
8	2332	90	Bh	2−1, 5+1	8·6
9	2333	30	D	=6	8·8*b*
13	2337	90	Bh	=5, =6	8·8
14	2338	94	Ni	=6	8·8
15	2339	45	Br	=5	8·7
15	2339	90	Bh	=6	8·8
19	2343	30	Bn	5 (3) v (1) 7, 6−2·5	9·2
21	2345	90	Bh	6−5, 16+8	9·3*b*
23	2347	22	Ni	6 (2) v (4) 10	9·1
23	2347	30	D	6−4, 7+2	9·2
26	2350	90	Bh	6−4, 16+9	9·2
28	2352	30	D	6−5, 7+1	9·3
31	2355	45	Bh	6−8, 9−2, 16+2, 19+8	9·8*b*
Feb					
2	2357	94	Ni	6 (5) v (4) 16, 6 (5) v (2) 10	9·5
6	2361	90	Bh	16+2	9·9
7	2362	94	Ni	6−8, 10+1, 16+2·5	9·7
11	2366	90	Bh	9−2, 16+3	9·8*b*
16	2371	60	D	16−1, 20+4	10·2
17	2372	90	Bh	16+2, 19+4	10·0
17	2372	75	Bn	16 (1) v (2) 20	10·3
17	2372	94	Ni	10 (2) v (2) 16	9·9
21	2376	45	Br	16−2, 19+2	10·3
22	2377	94	Ni	16 (4) v (3) 24	10·7
23	2378	60	D	16−3, 19+2	10·4
23	2378	90	Bh	16+1, 19+3, 20+3	10·2*b*
27	2382	,,	,,	16−2, 19+2	10·3*b*
28	2383	94	Ni	16 (6) v (1·5) 24	10·9
29	2384	160	Br	=20, 24+5	10·6*b*
Mar					
7	2391	90	Bh	=24	11·1
8	2392	,,	,,	=26	11·4
8	2392	120	Bn	24 (2) v (1) 26	11·3
11	2395	160	Br	24−1, 26+2	11·2
11	2395	90	Bh	26−2	11·6
12	2396	120	Bn	=26	11·4
15	2399	94	Ni	26 (4) v (3) 36	12·0
15	2399	60	D	26−4	11·8*b*
17	2401	90	Bh	26−3, 36+5	11·8
18	2402	120	Bn	=29	11·8
19	2403	79	Ma	24−2, 36+2	11·8
20	2404	,,	,,	=45	12·6
22	2406	90	Bh	=36, =39	12·5*b*
22	2406	120	Bn	=33	12·2
23	2407	160	Br	26−3, 31+3	11·7
23	2407	79	Ma	38−2	12·7

Jan. 5, Ni, With 22, 8·8.
Jan. 14, With 22, 9·0.
Feb. 7, With 22, 9·9.
Feb. 17, Ni, With 22, 10·0.
Mar. 20, About.

Date.	Julian Date.	Inst.	Observer.	Comparisons.	Deduced
1920					
Mar					
31	2415	90	Bh	45−1, 50+3	12
Apr					
1	2416	94	Ni	26 (7) v (1) 36	12
10	2425	90	Bh	24−8, 26−6, 36+4	12
11	2426	60	D	29−1	11
12	2427	90	Bh	26−4	11
13	2428	79	Ma	26+1	11
16	2431	,,	,,	24+1, 26+2	11
16	2431	60	D	26−1	11
16	2431	160	Br	24−1	11
16	2431	94	Ni	26 (5) v (3) 36	12
16	2431	90	Bh	26−1	11
17	2432	,,	,,	=26	11
19	2434	79	Ma	24+1	11
20	2435	94	Ni	=24, 26+2	11
21	2436	75	Bn	24 (1) v (2) 26	11
21	2436	90	Bh	=24	11
21	2436	79	Ma	20 (1) v (1) 24	10
27	2442	90	Bh	16−4, 19+2	10
28	2443	79	Ma	16+2·5	9
29	2444	160	Br	9+1	9
29	2444	75	Bn	10 (2) v (1) 13	9
May					
3	2448	,,	,,	=10	9
4	2449	90	Bh	6−5, 16+8	9
4	2449	79	Ma	5 (2) v (1) 9	9
4	2449	22	Ni	6 (3) v (2) 10	9
7	2452	50	Bn	5 (5) v (2) 7	9
7	2452	90	Bh	5−1	8
9	2454	22	Ni	6 (2) v (4) 10	9
9	2454	50	Ma	5 (3) v (7) 9, 6 (1) v (1) 19	9
13	2458	,,	Bn	5 (2) v (1) 7	9
13	2458	90	Bh	=3	8
14	2459	45	Br	=2	8
14	2459	50	Ma	6 (2) v (3) 19, 6−4	9
16	2461	22	Ni	6 (1) v (4) 10	9
17	2462	90	Bh	=2, =3	8
18	2463	50	Ma	5+2, 6+2·5, 2 (1) v (1) 5	8
19	2464	,,	Bn	=5	8
21	2466	90	Bh	=2	8
22	2467	45	Br	2+1	8
23	2468	75	Bn	=3	8
23	2468	22	Ni	=5	8
23	2468	45	Bh	2+1	8
29	2474	30	Bn	1 (1) v (1) 2	8
June					
1	2477	50	,,	1 (1) v (1) 2	8
2	2478	45	Bh	1+2, 5+5	8
2	2478	94	Ni	2+2·5	8
5	2481	30	Bn	1 (2) v (1) 2	8
8	2484	,,	,,	2 (1) v (1) 3	8
8	2484	45	Br	2+1	8
8	2484	90	Bh	1+1, 2+2, 5+5	8
15	2491	45	Bh	=1, =2	8

June 2, Ni, With 22, 8·6.

(2186) X AURIGÆ—*continued.*

1920					
July					
8	2514	94	Ni	=16	10·1
10	2516	45	Bh	6+1	8·7
14	2520	94	Ni	16 (5) v (2·5) 24	10·8
17	2523	160	Br	=16	10·1*b*
24	2530	94	Ni	16 (7) v (2) 24	10·9*b*
27	2533	,,	,,	16 (7) v (1·5) 24	10·9
30	2536	90	Bh	6—10, 9—3, 16+2	9·9
Aug					
3	2540	94	Ni	=24	11·1
13	2550	45	Bh	16—5, 24+5	10·6*b*
18	2555	90	,,	24—1, 26+2	11·2
20	2557	,,	,,	=24, =26	11·3*b*
22	2559	75	Bn	24 (3) v (1) 26	11·3*b*
29	2566	90	Bh	24—2, 26+1	11·3
Sept					
4	2572	,,	,,	24—5, 26—1	11·6
6	2574	94	Ni	26 (4) v (4) 36	11·9*b*
8	2576	60	D	26—3	11·7*b*
10	2578	94	Ni	26 (4) v (4) 36	11·9
10	2578	90	Bh	24—6, 26—4	11·8
12	2580	120	Bn	24 (1) v (1) 26	11·3*b*
13	2581	90	Bh	24—5, 26—3	11·7
16	2584	,,	,,	26—5	11·9
18	2586	94	Ni	26 (2·5) v (4·5) 36	11·8
19	2587	160	Br	24—1, 26+2	11·2*b*
19	2587	120	Bn	24 (2) v (1) 26	11·3
22	2590	90	Bh	24—2, 26+1	11·3
25	2593	45	,,	24—1, 26+2	11·2
28	2596	90	,,	=24, 26+3	11·1*b*
28	2596	94	Ni	16 (7) v (2) 24	10·9
Oct					
1	2599	90	Bh	19—3 20—3, 24+2, 26+6	10·9
2	2600	,,	,,	=19, =20	10·6*b*
3	2601	30	D	16—3, 19+2	10·4*b*
4	2602	94	Ni	16 (7·5) v (2·5) 24	10·9
6	2604	160	Br	=16	10·1
6	2604	90	Bh	16+1	10·0
8	2606	30	D	16—1, 19+3	10·2
9	2607	45	Bh	6—9, 16+3	9·8*b*
10	2608	94	Ni	10+1, 16+2·5	9·7
11	2609	30	D	7—5, 16+2	9·9
12	2610	90	Bh	16+1	10·0
18	2616	50	Bn	5 (3) v (1) 7	9·2
18	2616	90	Bh	6—9, 16+3	9·8
18	2616	94	Ni	6 (4) v (4) 10	9·3
18	2616	30	D	6—4, 7+3	9·2
20	2618	,,	,,	6—4, 7+3	9·2
22	2620	90	Bh	6—1	8·9
23	2621	50	Bn	5—2	8·9
24	2622	22	Ni	6 (1) v (4) 10	9·0
25	2623	90	Bh	=5, 6+1	8·7
29	2627	45	,,	=1, 3+2, 5+3	8·4
29	2627	,,	Br	2+3	8·2
30	2628	50	Bn	1+1, 2+2	8·3
Nov					
1	2630	,,	,,	1+2	8·2
1	2630	30	D	2—0·5	8·6*b*
1	2630	22	Ni	2 (1) v (1) 5	8·6
1	2630	45	Bh	1+3, 3+5	8·1
5	2634	,,	,,	1+5, 3+8, 5+10	7·8
8	2637	45	Bh	1+5	7·9
9	2638	22	Ni	1+3, 6+2	8·4
10	2639	45	Bh	1+4, 2+5	8·0
11	2640	50	Bn	1+2	8·2
13	2642	45	Bh	1+3, 3+5	8·1
15	2644	,,	,,	=1, 3+2, 5+3	8·4
16	2645	,,	Br	2+2	8·3
17	2646	22	Ni	2—1, =5	8·7
18	2647	90	Bh	2—1, =3, 5+2	8·6
20	2649	50	Bn	1+1	8·3
20	2649	45	Bh	3—1, 5+1	8·7
20	2649	50	Ma	2—1, 5+3	8·5
21	2650	22	Ni	2—1·5	8·7
21	2650	25	Ad	=5	8·7*b*
30	2659	90	Bh	3—1, =5	8·7
Dec					
4	2663	22	Ni	6 (1·5) v (4·5) 10	9·0
8	2667	90	Bh	5—10, =9, 16+5	9·6
9	2668	45	Br	5—4, 9+2	9·3
9	2668	50	Bn	5 (6) v (1) 7	9·3
11	2670	90	Bh	9—4, 16+1	10·0
17	2676	,,	,,	=20, 24+5	10·6*b*
21	2680	,,	,,	24+2, 26+5	10·9
22	2681	94	Ni	16 (7) v (1·5) 24	10·9
26	2685	90	Bh	24—5, 26—2	11·6
28	2687	,,	,,	24—8, 26—5	11·9
28	2687	75	Bn	20 (3) v (1) 24	11·0
28	2687	64	Ad	26—1	11·5*b*
31	2690	160	Br	=26	11·4
1921					
Jan					
2	2692	90	Bh	=24, =26	11·3*b*
6	2696	,,	,,	26—5, 39+5	12·0
9	2699	94	Ni	26 (5) v (1) 36	12·2
13	2703	90	Bh	=36, 38+1	12·4
14	2704	120	Br	=36	12·4
14	2704	,,	Bn	29 (2) v (1) 36	12·2*b*
16	2706	94	Ni	36—1	12·5
21	2711	90	Bh	36—2, 38—2	12·7*b*
30	2720	,,	,,	=39, 50+5	12·5
Feb					
2	2723	,,	,,	26—10, =36, =38	12·4
3	2724	160	Br	=36	12·4
9	2730	90	Bh	26—10, 50+5	12·4
10	2731	94	Ni	26 (6) v (3) 36	12·1
14	2735	120	Bn	29—1	11·9*b*
17	2738	90	Bh	=39, 45+2	12·5
20	2741	,,	,,	=38, =39	12·5
20	2741	94	Ni	26 (3) v (4) 36	11·8
25	2746	160	Br	24—2, 26+1	11·3
25	2746	90	Bh	26—3	11·7
26	2747	79	Ma	24 (3) v (1) 26	11·3
26	2747	120	Bn	26 (1) v (2) 29	11·5
Mar					
2	2751	94	Ni	26 (1·5) v (6) 36	11·6
2	2751	50	Ma	16 (1) v (1) 26, =24	10·9
2	2751	90	Bh	=24	11·1
7	2756	,,	,,	20—3, 24+2	10·9
7	2756	50	Ma	20 (1) v (1) 24	10·9
10	2759	94	Ni	16 (8) v (1) 24, 16 (8) v (2) 26	11·1
10	2759	90	Bh	20—2, 24+3	10·8
10	2759	120	Bn	24 (3) v (1) 26	11·3
14	2763	94	Ni	16 (7) v (1) 24	11·0

July 17, About. Difficult.
Sept. 8, About. Difficult.
Sept. 12, 19, Bn, t.
Oct. 10, With 22, 10·0.
Oct. 18, Ni, With 22, 9·5.

Jan. 14, Bn, t.

(2186) X AURIGÆ—*continued.*

1921					
Mar					
14	2763	50	Ma	16 (1) v (1) 24, 20−2	10·7
18	2767	,,	,,	16 (1) v (1) 24	10·6
18	2767	,,	Bn	16 (3) v (1) 19	10·4
20	2769	94	Ni	16 (6) v (3) 24	10·8
21	2770	160	Br	16−1	10·2
21	2770	45	Bh	6−10, 9−2, 16+3	9·8
24	2773	90	,,	9−2, 16+4	9·8
24	2773	120	Bn	16−1	10·2
24	2773	79	Ma	16−1	10·2
26	2775	50	,,	16+2, =19	10·2
29	2778	90	Bh	6−7, 16+5	9·6
30	2779	50	Ma	16+2·5, 19+3	10·0
31	2780	,,	Bn	=13	9·9*b*
31	2780	94	Ni	16+1·5	10·0
Apr					
1	2781	90	Bh	9+1	9·5
3	2783	79	Ma	16+2, 20+6	10·0
3	2783	60	D	7−3, 16+4	9·7
4	2784	30	,,	7−5, 16+2	9·9
5	2785	79	Ma	16+4, 19+2, 20+4	10·1
6	2786	75	Bn	8+1	9·4
7	2787	30	D	7−5, 16+2	9·9
7	2787	90	Bh	6−5, 9+4	9·3
7	2787	22	Ni	=10	9·7
8	2788	45	Br	5−4, 6−2	9·1
8	2788	50	Ma	6 (1) v (1) 19	9·7
10	2790	,,	,,	6 (4) v (1) 19	10·2
12	2792	30	Bn	5 (3) v (1) 7	9·2
12	2792	90	Bh	5−4, 9+5	9·1
14	2794	50	Ma	6 (2) v (1) 19	9·9
15	2795	90	Bh	5−3, 6−2, 9+6	9·0
18	2798	22	Ni	5 (3·5) v (1·5) 6	8·8
23	2803	75	Bn	5−1·5	8·9
23	2803	90	Bh	=3, 5+2	8·6
27	2807	,,	,,	=2	8·5
27	2807	22	Ni	5 (4) v (4) 6	8·8
28	2808	45	Br	=2	8·5
28	2808	50	Bn	2 (3) v (2) 5, 3+1	8·6
29	2809	,,	Ma	2+1, 5+3	8·4
30	2810	90	Bh	=1, 2+1, 5+3	8·4
May					
1	2811	30	D	=2	8·5*b*
1	2811	,,	Bn	1 (1) v (1) 3, 2+1	8·5
7	2817	90	Bh	=2, =3	8·6
8	2818	45	Br	2+1	8·4
8	2818	30	Bn	1 (2) v (1) 2	8·5
9	2819	45	Bh	=1, 2+1, 3+2, 5+4	8·4
10	2820	50	Ma	2+1, 5+3, 6+2	8·5
12	2822	22	Ni	5 (2) v (1) 6	8·8
15	2825	90	Bh	=2, =3	8·6
21	2831	50	Bn	6 (3) v (2) 7	9·2
23	2833	45	Bh	=5, 6+1	8·7
24	2834	94	Ni	6+1	8·7
29	2839	,,	,,	6 (5) v (1) 10	9·6
31	2841	45	Bh	6−2	9·0
June					
2	2843	90	,,	6−5, 16+8	9·3
6	2847	94	Ni	16 (1·5) v (5) 24	10·3
7	2848	50	Bn	16 (1) v (2) 20	10·3
15	2856	90	Bh	6−9, 16+4	9·7*b*
18	2859	150	,,	16+2	9·9

Mar. 31, Ni, With 22, 10·1.
April 8, Ma, Pale yellow.
May 29, With 22, 9·5.

1921					
June					
27	2868	90	Bh	=16	10·1
July					
2	2873	94	Ni	=36	12·4
7	2878	,,	,,	=36	12·4
8	2879	,,	,,	36 (4) v (1) 50	12·8
23	2894	90	Bh	<38, <39	<12·5
29	2900	,,	,,	45−2	12·8
Aug					
15	2917	,,	,,	24−1	11·2
15	2917	94	Ni	=26	11·4
16	2918	90	Bh	20−4, 24+1	11·0
19	2921	,,	,,	20−2, 24+3	10·8
22	2924	94	Ni	16 (5) v (2·5) 24	10·8
25	2927	90	Bh	19−3, 20−1	10·8
26	2928	94	Ni	16 (5) v (3·5) 24	10·7
28	2930	60	D	16−3, =19	10·5
30	2932	160	Br	16−5, 24+5	10·6
30	2932	90	Bh	=19	10·5
Sept					
1	2934	94	Ni	16+1	10·0
2	2935	30	D	16−1, 19+3	10·2
3	2936	,,	,,	7−5, 16+2	9·9
4	2937	90	Bh	16−2, 20+4	10·3
5	2938	,,	,,	16−1	10·2
5	2938	75	Bn	16 (2) v (1) 19	10·4
5	2938	30	D	16+2	9·9
6	2939	32	Ca	=17	10·3
6	2939	90	Bh	=16	10·1
7	2940	30	D	7−5, 16+3	9·9
10	2943	45	Br	=9	9·6
14	2947	30	D	7−3, 16+4	9·7
16	2949	94	Ni	6 (3) v (3) 10	9·3
16	2949	90	Bh	5−5, 6−4, 9+2	9·3
24	2957	,,	,,	=6	8·8
24	2957	30	D	6−4, 7+2	9·2
25	2958	45	Br	=5, =6	8·8
25	2958	90	Bh	6+1	8·7
25	2958	22	Ni	=6	8·8
27	2960	50	Bn	5 (2) v (1) 6, 5 (1) v (2) 7	8·9
27	2960	30	D	6−1, 7+5	8·9
29	2962	22	Ni	=6	8·8
30	2963	30	D	=6	8·8
30	2963	90	Bh	=6	8·8
Oct					
1	2964	50	Bn	=5	8·7
5	2968	30	,,	=3, 5+1	8·6
5	2968	90	Bh	=5, 6+1	8·7
5	2968	30	D	4−2, 6+2	8·7
7	2970	32	Ca	=3	8·6
8	2971	45	Bh	=1, 3+2, 5+3	8·4
10	2973	22	Ni	5 (1) v (1) 6	8·8
14	2977	45	Br	2+4	8·1
17	2980	,,	Bh	1+1, 3+3, 5+5	8·3
23	2986	90	,,	5+3, 6+5	8·2
23	2986	50	Bn	1 (1) v (1) 2	8·1
25	2988	45	Br	2−1, 5+1	8·6
27	2990	32	Ca	=5	8·7
27	2990	90	Bh	=5, 6+1	8·7
31	2994	,,	,,	=5	8·7
Nov					
2	2996	22	Ni	6 (2) v (4) 10	9·1
6	3000	50	Bn	5 (3) v (1) 7	9·3
6	3000	45	Br	5−3, 9+6	9·0
7	3001	90	Bh	6−2	9·0

July 23, Not seen.

(2186) X AURIGÆ—*continued.*

1921					
Nov					
10	3004	94	Ni	6 (5) v (2) 10	9·4
10	3004	50	Bn	7+1	9·3
12	3006	90	Bh	6−5, 16+5	9·5*b*
20	3014	80	Ca	=19, =20	10·6*b*
22	3016	94	Ni	16 (6) v (1·5) 24	10·9
23	3017	64	Ad	20 (1) v (2) 26	10·9
23	3017	90	Bh	16−2, 19+2	10·3
24	3018	,,	,,	=19, =20	10·6
24	3018	94	Ni	16 (7) v (1·5) 24	10·9
26	3020	120	Bn	=24	11·1
29	3023	90	Bh	24−2, 26+1	11·3
Dec					
3	3027	,,	,,	26−4	11·8
3	3027	94	Ni	26 (4) v (2) 36	12·1
3	3027	160	Br	26−2	11·6
10	3044	94	Ni	50 (3) v (3) 54	13·1*b*
10	3044	90	Bh	=36	12·4
11	3045	,,	,,	=36, =37	12·4
12	3046	120	Bn	36 (1) v (1) 54	12·8
13	3047	160	Br	=50	12·9
14	3048	94	Ni	50 (4) v (2) 54	13·1
15	3049	90	Bh	=39, =40, 44+1	12·5
18	3052	85	Bn	<44	<12·6
19	3053	94	Ni	50 (3) v (3) 54	13·1
20	3054	90	Bh	50−1, 54+2	13·0
1922					
Jan					
1	3056	,,	,,	=50	12·9
3	3058	150	,,	50−1, =51, =52	13·0
3	3058	160	Br	50+3	12·6
4	3059	60	D	<31	<12·0
6	3061	94	Ni	36 (1) v (3) 50	12·5
8	3063	150	Bh	=44, =45	12·6
10	3065	90	,,	=39, 44+1	12·5
10	3065	94	Ni	26 (6) v (2·5) 36	12·1
17	3072	75	Bn	26−3, 29+1	11·7
18	3073	90	Bh	24−4, 26−1	11·5
19	3074	94	Ni	26 (5) v (3) 36	12·0
20	3075	90	Bh	24−1, 26+2	11·2
29	3084	,,	,,	24+1	11·0
Feb					
2	3088	,,	,,	16−2	10·3
5	3091	,,	,,	16+1	10·0
6	3092	60	D	16−2, 19+2	10·3
10	3096	94	Ni	16+1	10·0
11	3097	50	Bn	7 (2) v (1) 10	9·6
17	3103	90	Bh	6−9, =9, 16+4	9·7
17	3103	79	Ma	19 (1) v (2) 20, 16+7	10·2
18	3104	50	Bn	5 (4) v (1) 7	9·3
18	3104	45	Br	5−1, =6	8·8
19	3105	79	Ma	6 (3) v (1) 19, 16+5	9·9
23	3109	32	Ca	6−1, 7+4	9·0
24	3110	50	Ma	6 (2) v (1) 19, 16+7	9·8
24	3110	22	Ni	6 (3) v (3) 10	9·3
24	3110	25	Bn	5 (5) v (2) 7	9·2
26	3112	90	Bh	6−2, 16+10	9·1
Mar					
4	3118	,,	,,	5−2, 6−1	8·9
4	3118	45	Br	2−1, 5+1	8·6
5	3119	32	Ca	6−1, 7+5	8·9
7	3121	50	Bn	3 (3) v (1) 5	8·7
10	3124	45	Bh	2−2, =5, 6+2	8·7
16	3130	90	,,	1−1, =2, =3	8·5
17	3131	32	Ca	=6	8·8
17	3131	22	Ni	5 (4) v (1) 6	8·8
1922					
Mar					
18	3132	50	Ma	5 (1) v (3) 9, 6+3	8·8
19	3133	45	Bh	=2, =3	8·6
21	3135	50	Bn	=5	8·7
22	3136	45	Bh	=1, =2, 3+1	8·5
23	3137	50	Ma	5 (1) v (4) 9, 6+2	8·8
24	3138	32	Ca	5−0·5, 6+0·5	8·8
25	3139	45	Br	2+1	8·4
28	3142	25	Bn	5+1	8·6
28	3142	90	Bh	2−1, 5+1	8·6
29	3143	22	Ni	5 (3) v (2·5) 6	8·8
31	3145	90	Bh	5+1	8·6
Apr					
4	3149	45	,,	=2, =3	8·6
4	3149	50	Bn	5+1	8·6
9	3154	22	Ni	6 (2) v (3) 10	9·2
14	3159	90	Bh	6−3, 16+10	9·1
15	3160	32	Ca	6−3, 7+3	9·1
17	3162	90	Bh	6−6, 16+6	9·5
19	3164	75	Bn	10 (2) v (1) 16	10·0
20	3165	94	Ni	=16	10·1
23	3168	90	Bh	9−2, 16+3	9·8
27	3172	75	Bn	16 (3) v (2) 20	10·4
28	3173	80	Ca	=18	10·4
29	3174	160	Br	=20	10·6
29	3174	90	Bh	=19, =20	10·6
May					
4	3179	50	Bn	20+1	10·5
6	3181	90	Bh	20−2, 24+2	10·9
8	3183	,,	,,	20−5, =24, 26+3	11·1
13	3188	120	Bn	24 (2) v (1) 26	11·3
17	3192	90	Bh	26−3	11·7
19	3194	120	Bn	29 (2) v (1) 33	12·1
23	3198	94	Ni	36−0·5	12·5
25	3200	,,	,,	36−1	12·5
25	3200	120	Br	26−6, 36+4	12·0
27	3202	,,	Bn	=45	12·6*b*
June					
1	3207	94	Ni	26 (6) v (1) 36	12·3*b*
29	3235	90	Bh	26−10	12·4*b*
July					
12	3248	94	Ni	16 (1·5) v (7) 24	10·3
18	3254	45	Br	5−2	8·9
20	3256	90	Bh	9−2, 16+2	9·9
27	3263	,,	,,	9−2, 16+2	9·9*b*
Aug					
5	3272	,,	,,	6−7, 16+6	9·5
7	3274	94	Ni	=5	8·7
12	3279	45	Bh	3−3, =6	8·9
15	3282	22	Ni	5 (2) v (1·5) 6	8·8*b*
17	3284	90	Bh	6+1	8·7
18	3285	45	Br	2+2, 5+2	8·4
20	3287	90	Bh	3−1, 6+1	8·7
25	3292	,,	,,	=1, 3+2, 5+3	8·4
25	3292	22	Ni	5 (1·5) v (1·5) 6	8·8
31	3298	45	Bh	=1, =2	8·5
Sept					
1	3299	,,	,,	=1, 3+2	8·4
3	3301	22	Ni	6 (2) v (3) 10	9·2
4	3302	45	Bh	=2, 3+1	8·5
7	3305	90	,,	5+2	8·5
10	3308	,,	,,	5+1, 6+2	8·6*b*

Nov. 10, Ni, With 22, 9·8.

Mar. 18, White. 6+3 doubtful obs.
Mar. 23, Pale yellow.
June 1, Very uncertain, but variable >36.
June 29, Glimpsed.
Aug. 7, With 22, 8·8.

(2186) X AURIGÆ—*continued.*

1922					
Sept					
10	3308	22	Ni	6 (3) v (3) 10	9·3
15	3313	90	Bh	=5	8·7
18	3316	,,	,,	5−1, =6	8·8*b*
18	3316	22	Ni	6 (4) v (2·5) 10	9·4
21	3319	90	Bh	5−2	8·9
26	3324	,,	,,	6−5, 16+8	9·3
28	3326	32	Ca	16−2, =17	10·3
28	3326	31	D	16−2, 19+1	10·4
29	3327	75	Bn	13 (3) v (1) 16	10·1
29	3327	45	Br	9−2, 16+3	9·8
30	3328	90	Bh	6−8, 16+5	9·6
Oct					
4	3332	,,	,,	6−10, 16+3	9·8
6	3334	94	Ni	16 (6) v (2) 24	10·9
7	3335	90	Bh	16−2, 20+3	10·3*b*
11	3339	,,	,,	24−1, 26+2	11·2
13	3341	,,	,,	=26	11·4
13	3341	50	Bn	24 (3) v (1) 26	11·3
13	3341	94	Ni	24 (1) v (0·5) 26	11·3
14	3342	44	Li	24 (8) v (2) 26	11·3
14	3342	90	Bh	=26	11·4
15	3343	193	Li	24 (9) v (1) 26	11·4
16	3344	94	,,	24 (8) v (2) 26	11·3
18	3346	90	Bh	26−3	11·7
21	3349	,,	,,	26−5, 36+5	11·9
21	3349	94	Ni	26 (5) v (1) 36	12·2
23	3351	120	Bn	33 (2) v (1) 36	12·3
25	3353	94	Ni	36 (2) v (4) 50	12·6
25	3353	90	Bh	26−8, 36+2	12·2
27	3355	,,	,,	=36, =39	12·5
27	3355	120	Br	=45	12·6
Nov					
1	3360	90	Bh	39−1, =44	12·6
4	3363	,,	,,	=44	12·6
9	3368	,,	,,	<44	<12·6
9	3368	94	Ni	36 (3) v (2) 50	12·7
11	3370	120	Br	50+3, 54+6	12·6
11	3370	90	Bh	45−1, 50+2	12·7
15	3374	94	Ni	36 (2·5) v (3) 50	12·6
18	3377	120	Bn	33 (1) v (1) 36	12·3
19	3378	90	Bh	50+2	12·7
21	3380	,,	,,	44−2, 50+2	12·8
24	3383	,,	,,	44+1	12·5
24	3383	120	Br	26−5, 38+5	12·0
25	3384	,,	Bn	29 (3) v (1) 33	12·1
26	3385	94	Ni	26 (4) v (1·5) 36	12·1
28	3387	90	Bh	26−7, 44+5	12·1
Dec					
1	3390	,,	,,	=24, =26	11·3*b*
6	3395	,,	,,	=19, =20	10·6
8	3397	50	Bn	16−3, 20+2	10·4
9	3398	90	Bh	16−2, 19+2	10·3
11	3400	,,	,,	=16	10·1
14	3403	94	Ni	16+1	10·0
16	3405	90	Bh	6−10, 16+3	9·8
17	3406	,,	,,	6−8, 16+5	9·6
17	3406	32	Ca	=16	10·1
18	3407	90	Bh	6−9, 16+4	9·7
18	3407	50	Bn	13 (1) v (1) 15, 16+1	10·0
20	3409	22	Ni	6 (6) v (3) 10, 16+2	9·6
20	3409	31	D	7−2·5, 16+4·5	9·7
21	3410	160	Br	16+2	9·9

1922					
Dec.					
24	3413	30	Bn	=10, 16+4	9·
25	3414	90	Bh	6−2	9·
28	3417	,,	,,	=6	8·
30	3419	22	Ni	6 (4) v (1·5) 10	9·
1923					
Jan					
4	3424	90	Bh	2−2, =5, 6+1	8·
5	3425	32	Ca	6 (4) v (2) 7	9·
6	3426	90	Bh	=5, =6	8·
7	3427	34	Li	=6	8·
10	3430	30	Bn	5 (2) v (1) 7	9·
11	3431	90	Bh	5−1, =6	8·
14	3434	,,	,,	=5, 6+2	8·
14	3434	34	Li	=4	8·
14	3434	30	Bn	5 (1) v (2) 7	8·
18	3438	,,	,,	3 (2) v (1) 5	8·
18	3438	34	Li	=3	8·
20	3440	,,	,,	=1	8·
20	3440	45	Br	=2	8·
20	3440	30	Bn	1 (1) v (1) 2	8·
20	3440	45	Bh	=3	8·
21	3441	32	Ca	=5, 6+1	8·
23	3443	34	Li	=2	8·
23	3443	30	Bn	1 (1) v (2) 2	8·
27	3447	45	Bh	=2, =3	8·
30	3450	,,	,,	=2, 3+1	8·
Feb					
3	3454	,,	,,	3−1, =5, 6+2	8·
3	3454	32	Ca	=5, 6+1	8·
4	3455	50	Bn	1−2, 2+0·5	8·
5	3456	34	Li	=3	8·
8	3459	45	Br	5−2, 9+6	9·
8	3459	90	Bh	=6	8·
8	3459	110	Rd	2 (3) v (2) 6	8·
11	3462	32	Ca	=5, 6+1	8·
18	3469	110	Rd	2 (7) v (3) 16	9·
21	3472	,,	,,	2 (7) v (3) 16	9·
27	3478	90	Bh	6−10, 16+3	9·
Mar					
2	3481	,,	,,	=16	10·
3	3482	110	Rd	5 (3) v (2) 24	10·
5	3484	44	Li	=16	10·
5	3484	50	Ma	16 (1) v (1) 20	10·
8	3487	90	Bh	16−2, 19+2	10·
9	3488	32	Ca	=20	10·
13	3492	90	Bh	=20	10·
15	3494	94	Ni	=24	11·
17	3496	120	Bn	24 (3) v (1) 26	11·
18	3497	79	Ma	24 (2) v (1) 26	11·
18	3497	94	Li	24 (5) v (5) 26	11·
20	3499	32	Ca	24 (2) v (1) 26	11·
20	3499	94	Ni	=26	11·
21	3500	90	Bh	24−2, 26+2	11·
25	3504	,,	,,	26−1	11·
31	3510	110	Rd	26 (4) v (1) 45	12·
Apr					
1	3511	90	Bh	26−6, 36+3	12·
2	3512	94	Ni	26 (5) v (1) 36	12·
3	3513	110	Rd	36 (7) v (3) 45	12·
7	3517	,,	,,	38 (2) v (3) 50	12·
				39 (4) v (1) 45	
7	3517	94	Ni	36 (8) v (2) 50	12·
8	3518	130	Ma	54+5	12·
8	3518	193	Li	46 (5) v (5) 50	12·
11	3521	94	Ni	=50	12·
13	3523	90	Bh	=39, =44	12·
13	3523	193	Li	50 (5) v (5) 54	13·
14	3524	130	Ma	45−5, 54+8	12·

Oct. 27, Br, About.
Nov. 9, Bh, Not seen.
Nov. 24, Bh, Unsteady.
Dec. 14, With 22, 10·5.

(2186) X AURIGÆ—*continued.*

923					
pr					
14	3524	110	Rd	39 (4) v (1) 54, 46 (4) v (1) 50	13·0
19	3529	193	Li	45 (5) v (5) 50	12·8*b*
19	3529	130	Ma	54+5	12·7
20	3530	90	Bh	39−2, =44, 50+2	12·7
20	3530	94	Ni	36 (2) v (2) 50	12·7
27	3537	160	Br	=46	12·6*b*
27	3537	90	Bh	=39, 44+1	12·5*b*
ay					
3	3543	,,	,,	26−2	11·6
3	3543	130	Ma	26−1	11·5
3	3543	110	Rd	26 (2) v (3) 38	11·8
4	3544	94	Ni	26 (3·5) v (3) 36	11·9
9	3549	45	Br	16−8, 26+4	11·0
0	3550	60	D	20−4, 26+4	11·0
1	3551	90	Bh	24−1, 26+2	11·2
7	3557	110	Rd	16 (1) v (4) 24	10·3
7	3557	79	Ma	16 (1) v (4) 24	10·3
8	3558	94	Ni	16 (6) v (3) 24	10·8
1	3561	90	Bh	16−2, 19+2	10·3
0	3570	45	,,	6−9, 16+4	9·7
ne					
2	3573	,,	,,	3−1, =5, 6+2	8·7*b*
1	3582	90	,,	=6	8·8
1	3592	45	,,	=2, 5+2	8·5
3	3594	,,	,,	=2, 5+3	8·5
ly					
6	3607	94	Ni	6−1	8·9*b*
8	3609	45	Bh	=2, =3	8·6*b*
2	3613	94	Ni	5 (2) v (3) 6	8·7
0	3621	45	Bh	=1, 2+1, 3+2, 6+5	8·4
0	3631	90	,,	2−1, 5+1	8·6
ug					
1	3633	94	Ni	6 (2) v (4) 10	9·1
3	3635	90	Bh	=5, 6+1, 9+8	8·7
9	3641	,,	,,	6−5, 16+8	9·3
1	3643	50	Bn	13 (1) v (1) 15, 16+2	9·9
5	3647	90	Bh	16−1	10·2
8	3650	,,	,,	16−4, 20+1	10·5
2	3654	,,	,,	24−1, 26+3	11·2
0	3662	,,	,,	=26	11·4*b*
pt					
2	3665	94	Ni	=36	12·4
3	3666	150	Bh	26−2	11·6
6	3669	94	Ni	36 (3) v (1) 50	12·8
7	3670	150	Bh	26−4, 36+4	11·9
8	3671	160	Br	36+2	12·2
9	3672	90	Bh	=36	12·4
1	3674	,,	,,	=36, =38, =39	12·5
1	3674	120	Bn	=45	12·6
3	3676	94	Ni	36 (3) v (1) 50	12·8
3	3676	90	Bh	=39, =44	12·6
5	3678	150	,,	50+1, 52+2	12·8
2	3685	,,	,,	=50, 52+1	12·9
3	3686	120	Bn	52−1	13·1*b*
6	3689	90	Bh	=50	12·9
0	3693	,,	,,	=44, =45	12·6
t					
1	3694	,,	,,	=36, =39	12·5*b*
1	3694	120	Br	50+2	12·7
4	3697	90	Bh	=36	12·4
6	3699	94	Ni	26 (6) v (0·5) 36	12·3

April 20, Ni, About.
April 27, Br, About. Difficult.
July 12, With 22, 8·8.

1923 Oct					
9	3702	90	Bh	26−6, 36+2	12·1
11	3704	,,	,,	24−8, 26−2	11·8*b*
11	3704	120	Br	26−1	11·5
12	3705	94	Ni	26 (4) v (3) 36	12·0
13	3706	32	Ca	<26	<11·4
14	3707	80	Rd	24 (5) v (5) 36, 26 (1) v (4) 38	11·7
17	3710	60	D	24−2, 26+2	11·3
17	3710	90	Bh	26−1	11·5
20	3713	,,	,,	=26	11·4*b*
21	3714	94	Ni	26 (1) v (6) 36	11·5
22	3715	80	Rd	16 (9) v (1) 24, 20 (3) v (2) 26	11·0
23	3716	90	Bh	20−6, =24, 26+3	11·1
25	3718	,,	,,	16−8, 19−5, 26+4	11·0
26	3719	94	Ni	24 (1) v (1) 26	11·3
26	3719	80	Rd	16 (4) v (1) 26, 24 (2) v (3) 26	11·2
Nov					
1	3725	32	Ca	24 (1) v (2) 26	11·2
1	3725	90	Bh	20−3, 26+5	10·9
2	3726	60	D	20−3, 24+4	10·8
3	3727	90	Bh	16−5, =20	10·6
5	3729	160	Br	20−2, 24+2	10·9
7	3731	50	Bn	16+1	10·0
7	3731	90	Bh	16−2	10·3
7	3731	80	Rd	16 (3) v (2) 24, 19 (3) v (2) 20	10·6
8	3732	94	Ni	16 (5) v (4) 24	10·7
9	3733	45	Bh	=16	10·1
9	3733	32	Ca	16 (1) v (3) 19	10·2
10	3734	60	D	9−4, 16+1	10·0
10	3734	80	Rd	9 (4) v (1) 16, 9 (1) v (4) 16	10·0
14	3738	,,	,,	7 (1) v (4) 20, 9 (1) v (4) 16	9·7
14	3738	32	Ca	=16	10·1
16	3740	94	Ni	6 (7) v (3) 16	9·7*b*
17	3741	90	Bh	6−9, 16+4	9·7
18	3742	50	Bn	=10, 13+2, 16+4	9·7
20	3744	32	Ca	7 (2) v (3) 13	9·6
23	3747	90	Bh	6−5, 16+8	9·3
27	3751	32	Ca	=7	9·4
30	3754	30	D	6−4, 7+2	9·2
30	3754	90	Bh	6−3, 16+10	9·1
Dec					
3	3757	50	Bn	5 (2) v (1) 7	9·2
4	3758	90	Bh	6−3	9·1
4	3758	80	Rd	2 (3) v (2) 16, 5 (2) v (3) 20	9·5
5	3759	32	Ca	6 (2) v (2) 7	9·1
8	3762	45	Br	6−2	9·0
8	3762	90	Bh	6+1	8·7
9	3763	30	D	6−5, 7+3	9·2
9	3763	22	Ni	6 (4) v (1) 10	9·5
11	3765	,,	,,	6 (4) v (2) 10	9·4
11	3765	32	Ca	=6	8·8
15	3769	50	Bn	5 (3) v (2) 7	9·1
16	3770	32	Ca	4 (1) v (1) 6	8·7
16	3770	80	Rd	2 (4) v (1) 5, 2 (5) v (5) 9	8·9*b*
18	3772	90	Bh	6+1	8·7
19	3773	50	Bn	6 (1) v (2) 7	9·0
22	3776	90	Bh	=5, 6+2	8·7
24	3778	,,	,,	2−1, 3−1, =5, 6+2	8·7

Oct. 13, Invisible.
Nov. 16, With 22, 9·9.

(2186) X AURIGÆ—*continued.*

1923 Dec					
24	3778	30	D	4−1, 6+2	8·7*b*
28	3782	90	Bh	=3	8·6
30	3784	,,	,,	=2, =3	8·6*b*
30	3784	32	Ca	4 (1) v (1) 6	8·7
30	3784	30	D	4−2, 6+1	8·8
1924 Jan					
1	3786	45	Br	=2	8·5
3	3788	22	Ni	=6	8·8
3	3788	90	Bh	2−1, 5+1	8·6
5	3790	T	Rd	2 (3) v (2) 5, 2 (4) v (1) 6	8·7*b*
5	3790	30	D	4−3, 6+1	8·8
6	3791	,,	,,	6−1	8·9
6	3791	50	Bn	3 (3) v (1) 6	8·8
7	3792	30	D	6−2, 7+4	9·0
8	3793	32	Ca	6 (2) v (4) 7	9·0
11	3796	90	Bh	5+1, 6+3	8·6
12	3797	30	D	6−5, 7+2	9·3*b*
12	3797	22	Ni	6 (5) v (2·5) 10	9·4
15	3800	30	D	6−4, 7+2	9·2
16	3801	90	Bh	5−6, 6−4	9·3
20	3805	,,	,,	6 (1) v (1) 16	9·7
23	3808	94	Ni	16 (4) v (4) 24	10·6
23	3808	32	Ca	16 (1) v (1) 17	10·2
25	3810	45	Br	16+1	10·0
25	3810	90	Bh	6−9, 16+4	9·7
25	3810	50	Bn	13 (1) v (1) 16	10·0
27	3812	30	D	16−2, 19+2	10·3
27	3812	80	Ca	16 (1) v (1) 17	10·2
27	3812	T	Rd	5 (4) v (1) 24, 9 (3) v (2) 16	10·3
31	3816	90	Bh	16+1	10·0
Feb.					
1	3817	120	Bn	16 (4) v (1) 19	10·4
1	3817	60	D	16−4, 19+1	10·5
1	3817	94	Ni	16 (6) v (1·5) 24	10·9
4	3820	90	Bh	16−4, =19, =20	10·5
8	3824	94	Ni	24+0·5	11·1
8	3824	60	D	24−1, 26+3	11·2
8	3824	T	Rd	24 (2) v (3) 26	11·2
9	3825	32	Ca	=21	10·8
14	3830	60	D	24−2, 26+1	11·3
18	3834	90	Bh	26−8, 36+2	12·2
20	3836	32	Ca	26 (2) v (2) 29, =28	11·6
21	3837	90	Bh	=44, =47	12·6
22	3838	94	Ni	26 (5) v (2·5) 36	12·1
24	3840	90	Bh	=44, =45	12·6
26	3842	,,	,,	39−2, 44−1	12·7
28	3844	,,	,,	44−2, 50+2	12·8
Mar					
4	3849	94	Ni	36 (2·5) v (1·5) 50	12·7
4	3849	80	D	29−4	12·2*b*
4	3849	90	Bh	=45, =46	12·6
7	3852	,,	,,	43−2, 50+2	12·8
8	3853	120	Bn	=36	12·4*b*
9	3854	T	Rd	26 (9) v (1) 38, 36 (2) v (3) 45	12·4
9	3854	90	Bh	50−1, 54+1	13·1
9	3854	94	Ni	36 (3) v (1) 50	12·8
10	3855	90	Bh	50−1	13·0
11	3856	,,	,,	=50	12·9
11	3856	130	Ma	50+4	12·5
15	3860	90	Bh	43−2, 50+2	12·8
19	3864	,,	,,	=44	12·6
22	3867	,,	,,	=36, =38	12·5
26	3871	,,	,,	26−5, 36+5	11·9
29	3874	94	Ni	24 (1·5) 26 (4) v (4) 36	11·9
1924 Mar					
29	3874	79	Ma	24 (3) v (1) 26	11·
29	3874	90	Bh	26−2	11·
30	3875	120	Bn	26 (3) v (1) 29	11·
30	3875	60	D	24−1, 29+4	11·
30	3875	T	Rd	20 (3) v (2) 36, 24 (3) v (2) 26	11·
Apr					
1	3877	,,	,,	16 (4) v (1) 26, 24 (1) v (4) 36	11·
2	3878	90	Bh	24−2, =26	11·
4	3880	,,	,,	=26	11·
4	3880	120	Bn	24 (4) v (1) 26	11·
4	3880	160	Br	24−2, 26+1	11·
4	3880	32	Ca	24 (1) v (2) 26, =25	11·
6	3882	60	D	20−5, 26+3	11·
6	3882	90	Bh	24−1, 26+1	11·
7	3883	120	Bn	23 (3) v (1) 26	11·
7	3883	18	Sg	20 (1) v (1) 24	10·
7	3883	79	Ma	20 (4) v (1) 24	11·
8	3884	32	Ca	22 (1) v (1) 24, =23	11·
8	3884	90	Bh	=24, 26+3	11·
9	3885	79	Ma	20 (2) v (1) 24	10·
11	3887	90	Bh	24+1	11·
12	3888	80	Ca	20 (2) v (1) 22, =21	10·
13	3889	94	Ni	16 (7) v (0·5) 24	11·
16	3892	90	Bh	=19, =20	10·
20	3896	,,	,,	16+1	10·
20	3896	50	Bn	16+1·5	10·
24	3900	32	Ca	6 (5) v (1) 7	9·
25	3901	90	Bh	6−3, 16+10	9·
29	3905	22	Ni	6 (4) v (3) 10	9·
30	3906	45	Bh	=5, 6+1	8·
May					
1	3907	32	Ca	6 (2) v (4) 7	9·
3	3909	45	Bh	2−1, =3, 5+1	8·
5	3911	,,	,,	=2, 3+1	8·
5	3911	T	Rd	2 (1) v (4) 5, 2 (2) v (3) 6	8·
5	3911	79	Ma	5−1	8·
5	3911	50	Bn	5 (1) v (3) 7	8·
5	3911	22	Ni	5 (3·5) v (2·5) 6	8·
7	3913	30	D	=4	8·
8	3914	45	Bh	2+1	8·
10	3916	,,	,,	=2, =3	8·
13	3919	,,	,,	=1, 3+2	8·
13	3919	30	D	=3	8·
16	3922	22	Ni	=2	8·
16	3922	45	Bh	=1, 3+1, 5+3	8·
16	3922	T	Rd	2+2	8·
16	3922	50	Bn	1+2, 2+3	8·
19	3925	,,	,,	1+2, 2+3	8·
22	3928	45	Bh	=2, =3	8·
24	3930	22	Ni	=2	8·
27	3933	50	Bn	1+1, 2+2	8·
27	3933	T	Rd	1+3	8·
27	3933	45	Bh	=3, 5+1	8·
30	3936	90	,,	5+2, 6+4	8·
June					
4	3941	,,	,,	=2, =3	8·
8	3945	94	Ni	2+1	8·
13	3950	45	Bh	=2, =3	8·
18	3955	,,	,,	2 (1) v (1) 6	8·
24	3961	,,	,,	6 (1) v (2) 16	9·
30	3967	,,	,,	=16	10·

May 5, Ma, Pale yellow.

(2186) X AURIGÆ—*continued.*

1924					
July					
2	3969	45	Bh	16−1	10·2*b*
6	3973	94	Ni	16 (1·5) v (6) 24	10·3
9	3976	90	Bh	16 (1) v (1) 19	10·3
11	3978	50	Bn	16 (4) v (1) 20	10·5
11	3978	94	Ni	16 (5) v (3) 24	10·7
14	3981	90	Bh	16 (1) v (2) 20	10·3
19	3986	,,	,,	16 (2) v (1) 20	10·4
22	3989	94	Ni	24 (1) v (2) 26	11·2
24	3991	90	Bh	=20	10·6
27	3994	,,	,,	19−4, 20−2	10·9
Aug					
3	4001	,,	,,	24−2, 26+1	11·3
8	4006	,,	,,	26−1	11·5
19	4017	,,	,,	26 (1) v (1) 36	11·9
25	4023	,,	,,	26 (2) v (1) 36	12·1
Sept					
2	4031	,,	,,	=39, =40	12·5
5	4034	,,	,,	=36, =39	12·5
9	4038	,,	,,	=40, =44	12·6
12	4041	,,	,,	26 (2) v (1) 36, 39+3	12·1
12	4041	94	Ni	16 (7) v (1) 24	11·0
16	4045	90	Bh	24 (1) v (2) 36, =26	11·5
22	4051	30	D	16+1	10·0
23	4052	T	Rd	5 (3) v (2) 20, 6 (4) v (1) 16	9·8
23	4052	90	Bh	16 (1) v (1) 26	10·8*b*
25	4054	,,	,,	16 (1) v (2) 26	10·5*b*
27	4056	,,	,,	=16	10·1
27	4056	45	Br	5−4, 9+4	9·2
29	4058	32	Ca	6 (2) v (4) 7	9·0
29	4058	90	Bh	6 (3) v (1) 16	9·8
Oct.					
2	4061	,,	,,	6 (1) v (2) 16	9·2
8	4067	45	,,	2−5, 6−2	9·0*b*
10	4069	32	Ca	2 (2) v (1) 6	8·7
11	4070	90	Bh	5−2, =6	8·9
14	4073	,,	,,	=5, 6+2	8·7
20	4079	,,	,,	2−2, 6+2	8·7*b*
23	4082	,,	,,	=5, 6+2	8·7
23	4082	45	Br	=2	8·5
23	4082	34	Li	=2	8·5
23	4082	22	Ni	2−3, 5−3, 6+2	8·8
23	4082	50	Bn	5 (1) v (3) 7	8·9
25	4084	32	Ca	=6	8·8
31	4090	90	Bh	=5, 6+1	8·7
Nov					
2	4092	32	Ca	2 (2) v (1) 6	8·7
3	4093	22	Ni	2−2, 5−4, 6+2	8·8
3	4093	45	Bh	=2, =3, =5	8·6*b*
3	4093	,,	Br	2+1	8·4
3	4093	50	Bn	=5	8·7
1924					
Nov					
3	4093	34	Li	=2	8·5
4	4094	,,	,,	=3	8·6
5	4095	60	D	=6	8·8
5	4095	45	Bh	2 (1) v (1) 5	8·6
8	4098	,,	,,	=3	8·6
11	4101	34	Li	=2	8·5*b*
13	4103	32	Ca	2 (2) v (1) 6	8·7
15	4105	22	Ni	6 (1) v (5) 10	9·0
15	4105	90	Bh	3 (1) v (1) 5	8·7
19	4109	45	,,	=5	8·7
22	4112	32	Ca	=6	8·8
24	4114	45	Bh	2−1, =5	8·7
25	4115	22	Ni	6 (2·5) v (4) 10	9·1
27	4117	T	Rd	2 (4) v (1) 6, 5 (1) v (4) 9	8·8
27	4117	45	Bh	=6	8·8
29	4119	32	Ca	=6	8·8
30	4120	30	D	=6	8·8
30	4120	34	Li	2 (5) v (5) 5	8·6
Dec					
1	4121	90	Bh	6 (1) v (3) 16	9·1
3	4123	34	Li	2 (8) v (2) 6	8·7
5	4125	22	Ni	6 (5) v (1) 10	9·6*b*
5	4125	T	Rd	5 (1) v (4) 9, 6 (1) v (9) 16	8·9*b*
5	4125	50	Bn	5 (4) v (1) 7	9·3
5	4125	90	Bh	6−1	8·9*b*
6	4126	,,	,,	6 (2) v (3) 16	9·3
6	4126	32	Ca	6 (2) v (4) 7	9·0
9	4129	34	Li	2 (7) v (3) 6	8·7
11	4131	32	Ca	6 (3) v (3) 7	9·1
12	4132	90	Bh	6 (2) v (1) 16	9·7
14	4134	,,	,,	16+2	9·9
14	4134	50	Bn	10 (1) v (1) 13	9·8
14	4134	32	Ca	7 (1) v (3) 12, =8	9·5
15	4135	34	Li	e (6) v (4) e′	9·5
18	4138	32	Ca	16 (1) v (3) 17	10·2
19	4139	90	Bh	16+1	10·0
22	4142	,,	,,	16 (1) v (1) 20	10·4
22	4142	30	D	=20	10·6
22	4142	32	Ca	=17	10·3
22	4142	94	Ni	16 (5) v (3) 24	10·7
24	4144	90	Bh	=20	10·6
25	4145	30	D	20−3, 24+3	10·9
26	4146	90	Bh	20−2	10·8
28	4148	60	D	24−2, 26+1	11·3
30	4150	90	Bh	24 (1) v (1) 26	11·3
30	4150	T	Rd	24 (2) v (3) 26	11·2
30	4150	94	Ni	=26	11·4

Dec. 5, Ni, Difficult.

(5237) R BOÖTIS. (V. 1.)

H.D. 143227.

Star A unidentified. Estimated $12^{m}\cdot26$. Position $\Delta\alpha + 19^{s}$, $\Delta\delta + 5''\cdot5$.
,, X = B.D. + 29°2555, $7^{m}\cdot93$, **H.A., 54,** 158.

Date.	Julian Date.	Inst.	Observer.	Comparisons.	Deduced Mag.
1920 Jan					
1	2325	75	Bn	6 (1) v (1) 7	9·9
5	2329	90	Bh	4−3, 7+5	9·6
5	2329	94	Bl	4 (3) v (3) 7	9·7
8	2332	30	Bn	4 (2) v (1) 6	9·5
9	2333	90	Bh	=4	9·2
11	2335	94	Bl	2 (4·5) v (1·5) 4	9·0
13	2337	30	Bn	3 (4) v (1) 4	9·1
14	2338	,,	D	3−1, 4+3	8·9*b*
15	2339	45	Bh	=2	8·4
16	2340	90	,,	1−12, 2+1, 3+6	8·2
16	2340	23	Bo	2 (1) v (3) 3	8·5
19	2343	,,	,,	2 (1) v (1) 3	8·6
19	2343	30	Bn	2 (3) v (1) 3	8·7
19	2343	22	Bl	=2	8·4
21	2345	,,	,,	2+1	8·3
21	2345	45	Bh	1−5, 2+10	7·4
23	2347	23	Bo	=2	8·4
23	2347	30	D	1 (5) v (1) 2, 2+2	8·2
23	2347	22	Bl	1 (8) v (2) 2	8·1
24	2348	45	Bh	1−5, 2+10	7·4
26	2350	,,	,,	1−3, 2+12	7·2
26	2350	30	Bn	2+3	8·1
28	2352	,,	D	1 (3) v (1) 2, 2+4	8·1
30	2354	,,	,,	1 (3) v (1) 2, 2+5	8·0*b*
31	2355	,,	Bn	1 (2) v (1) 2	7·9
31	2355	23	Bo	1 (2) v (1) 2	7·9*b*
Feb					
2	2357	22	Bl	1 (4) v (6) 2	7·5
5	2360	,,	,,	1+0·5	6·9
5	2360	23	Bo	=1	6·9
5	2360	45	Bh	1+3	6·6
7	2362	,,	,,	1+3	6·6
11	2366	B	Bo	b (3) v (1) 1	6·7
11	2366	30	Bn	a (4) v (1) 1	6·7
11	2366	45	Bh	1+3	6·6
13	2368	,,	,,	1+4	6·5
14	2369	22	Bl	a (9) v (1) 1	6·8
15	2370	45	Bh	1+4	6·5
16	2371	B	Bo	b (2) v (1) 1	6·7
16	2371	30	D	1+4	6·5
17	2372	,,	Bn	a (3) v (1) 1	6·6
17	2372	45	Bh	1+4	6·5
18	2373	B	Bo	b (2) v (1) 1	6·7
18	2373	30	D	1+3	6·6*b*
22	2377	B	Bo	b (1) v (2) 1	6·4
23	2378	30	D	1+5	6·4
23	2378	45	Bh	1+3	6·6
27	2382	,,	,,	1+3	6·6
27	2382	B	Bo	b (4) v (1) 1	6·8
28	2383	22	Bl	a (7) v (3) 1	6·6
Mar					
2	2386	30	Bn	a (3) v (1) 1	6·6
4	2388	45	Bh	=1	6·9
4	2388	22	Bl	a (7) v (3) 1	6·6
7	2391	45	Bh	=1	6·9
8	2392	30	Bn	1+1	6·8
11	2395	45	Bh	1−2	7·1
12	2396	B	Bo	b (1) v (1) 1	6·6
12	2396	30	Bn	1 (1) v (3) 2	7·3
12	2396	,,	D	1 (1) v (3) 2, 1−3	7·3
13	2397	22	Bl	=1	6·9
17	2401	45	Bh	1−5, 2+10	7·4
18	2402	30	Bn	1 (3) v (1) 2	8·1
18	2402	,,	D	1 (1) v (2) 2, 1−6	7·4
19	2403	23	Bo	1 (1) v (3) 2, 1 (1) v (2) X	7·3
20	2404	50	Bn	2+2·5	8·2
21	2405	30	D	1 (3) v (2) 2, 2+6	7·8
22	2406	,,	,,	1 (3) v (1) 2, 2+4	8·1
22	2406	50	Bn	1 (4) v (1) 2	8·1
22	2406	45	Bh	1−7, 2+6	7·7
22	2406	22	Bl	1 (4) v (4) 2	7·7
29	2413	,,	,,	1 (8) v (1) 2	8·3
30	2414	23	Bo	X (1) v (1) 2	8·2
31	2415	45	Bh	2+5, 3+10	7·9
Apr					
6	2421	23	Bo	2 (3) v (1) 3	8·7
6	2421	30	D	2−1, 3+3	8·5
9	2424	90	Bh	=2	8·4
10	2425	22	Bl	2 (2) v (3) 4	8·8
11	2426	30	D	3−3, 4+2	9·1
12	2427	90	Bh	2−3, 3−5	9·0
15	2430	23	Bo	3 (1) v (1) 4	9·0
15	2430	22	Bl	=4	9·2
19	2434	79	Ma	4−3·5	9·6
21	2436	30	Bn	4 (3) v (1) 6	9·6
21	2436	90	Bh	3−5, =4	9·3
21	2436	30	D	4−2, 6+3	9·4
27	2442	90	Bh	=4	9·2
27	2442	22	Bl	4 (5) v (1) 7	9·9
28	2443	79	Ma	9+7	9·9
29	2444	75	Bn	6−3, 7+2	9·9
May					
4	2449	50	,,	7 (2) v (1) 9	10·4
4	2449	79	Ma	8+3, 10+5	10·3
4	2449	94	Bl	4 (5) v (3) 7	9·8
4	2449	90	Bh	4−6, 7+3	9·8
7	2452	,,	,,	4−10, =7	10·2
7	2452	50	Ma	9+1, 10+3	10·5
7	2452	60	D	7−3, 9+2	10·4
9	2454	50	Ma	=9, 10+2	10·6
10	2455	60	D	=7	10·1
10	2455	94	Bl	7 (2) v (3) 10	10·4
13	2458	90	Bh	9−2, =10	10·8
14	2459	120	Bn	=10	10·9
14	2459	60	D	8−4, 10+1	10·8
14	2459	79	Ma	=10	10·9
18	2463	,,	,,	10+1	10·8
21	2466	120	Bn	13 (2) v (1) 16	11·6
21	2466	94	Bl	13 (4·5) v (1·5) 16	11·6
21	2466	90	Bh	=10, 12+2	10·9
22	2467	79	Ma	10 (1) v (2) 13	11·0
23	2468	90	Bh	12−1, =13	11·3

Feb. 16, 18, 23, D, With B, 6·6.

(5237) R BOÖTIS—*continued.*

1920 May					
29	2474	120	Bn	16−2	11·9
June					
2	2478	90	Bh	=16	11·7*b*
4	2480	,,	,,	16−1	11·8*b*
6	2482	120	Bn	16 (4) v (1) 18, 19+2	12·1
8	2484	90	Bh	16−3, 20+1	12·1
8	2484	60	D	16−3, 18+2	12·0*b*
8	2484	94	Bl	16 (3) v (5) 20	11·9
9	2485	120	Bn	16 (4) v (1) 18, 19+2, 20+3	12·0
11	2487	,,	D	18−1	12·3
15	2491	90	Bh	18−1, 20−1	12·3
16	2492	94	Bl	18−2·5	12·4
18	2494	90	Bh	18−1, 20−1	12·3
23	2499	,,	,,	=18, =20	12·2
29	2505	,,	,,	16−2, 20+3	11·9
30	2506	94	Bl	=18, =20	12·2
July					
11	2517	90	Bh	=12, =13	11·2*b*
14	2520	94	Bl	16 (5) v (3) 18	12·0
15	2521	79	Ma	13−3, 16−1	11·7
15	2521	120	Bn	16 (3) v (1) 18	12·1
15	2521	90	Bh	10−1, 12+2	11·0*b*
19	2525	60	D	<9	<10·6*b*
24	2530	94	Bl	13 (1) v (3) 16	11·4
24	2530	120	Bn	10 (4) v (1) 13	11·2
24	2530	90	Bh	=8, =10	10·7*b*
26	2532	,,	,,	=8, =9	10·5
30	2536	,,	,,	4−6, 7+3	9·8*b*
Aug					
1	2538	79	Ma	9+1·5	10·4
2	2539	90	Bh	6−2, 7+2	9·9
6	2543	,,	,,	4−5, 5−5, 7+2	9·8
6	2543	30	Bn	6 (2) v (1) 7	10·0
8	2545	90	Bh	4−6, 7+3	9·8
9	2546	50	Ma	2 (6) v (1) 9, 4 (3) v (2) 7	10·0*c*
13	2550	90	Bh	=6	9·7
13	2550	22	Bl	4 (1·5) v (4·5) 7	9·5
14	2551	30	Bn	4 (3) v (1) 6	9·6
15	2552	50	Ma	3−2	9·0
16	2553	23	Bo	=4	9·2*b*
18	2555	45	Bh	3−2, 4+2	9·0
19	2556	75	Bn	4 (1) v (3) 6	9·4
22	2559	50	Ma	3−1	8·9
22	2559	30	Bn	4+1	9·1
26	2563	,,	,,	2 (4) v (1) 4, 3−3	9·1
28	2565	45	Bh	2−1, 3+2	8·6*b*
Sept					
1	2569	90	,,	2+3	8·1
4	2572	45	,,	1−10, 2+5	7·9
5	2573	30	Bn	2 (5) v (2) 3	8·7
8	2576	23	Bo	2+1	8·3
10	2578	30	Bn	2 (1) v (1) 3	8·6
12	2580	23	Bo	2 (1) v (3) 3	8·5
12	2580	30	D	2+2	8·2
13	2581	45	Bh	1−10, 2+5	7·9
16	2584	50	Bn	1 (4) v (1) 2	8·1
16	2584	22	Bl	1 (7) v (2) 2	8·1
19	2587	23	Bo	2+1	8·3
19	2587	45	Bh	1−10, 2+5	7·9
26	2594	,,	,,	1−6, 2+9	7·5
27	2595	30	Bn	1 (2) v (1) 2	7·9
29	2597	23	Bo	1 (3) v (1) 2	8·1
29	2597	45	Bh	1−6, 2+9	7·5

June 8, D, Difficult.

1920 Oct					
1	2599	90	Bh	1−6, 2+9	7·5
2	2600	30	Bn	1 (1) v (2) 2	7·4
4	2602	22	Bl	1 (9) v (1) 2	8·3
5	2603	23	Bo	1 (2) v (1) 2	7·9
6	2604	30	Bn	1 (2) v (1) 2	7·9
6	2604	45	Bh	1−5, 2+10	7·4
9	2607	23	Bo	1 (2) v (1) 2	7·9
9	2607	30	Bn	1 (3) v (1) 2	8·1
12	2610	45	Bh	1−5, 2+10	7·4
13	2611	22	Bl	1 (7) v (1) 2	8·2
16	2614	23	Bo	1 (1) v (2) 2	7·4*c*
18	2616	45	Bh	1−7, 2+8	7·6
20	2618	23	Bo	1 (4) v (1) 2	8·1
20	2618	22	Bl	1 (7) v (3) 2	8·0
22	2620	45	Bh	1−10, 2+5	7·9*b*
24	2622	30	Bn	1 (3) v (1) 2	8·1
24	2622	,,	D	1 (3) v (1) 2, 2+3	8·1*b*
27	2625	50	Bn	2+3	8·1
29	2627	22	Bl	1 (6) v (2) 2	8·1
29	2627	90	Bh	2+5	7·9*b*
Nov					
1	2630	45	,,	1−10, 2+5	7·9*b*
1	2630	50	Bn	2+1	8·3
4	2633	,,	,,	2−1	8·5
7	2636	55	Bo	1 (9) v (1) 2	8·3
8	2637	22	Bl	1 (9) v (1) 2, =2	8·3
8	2637	45	Bh	1−12, 2+2, 3+6	8·2
11	2640	90	,,	2−1	8·5
16	2645	45	,,	2−2, 3+1	8·7
16	2645	50	Bn	3−1	8·9
18	2647	23	Bo	3 (1) v (3) 4	8·9
19	2648	22	Bl	2 (1·5) v (2·5) 4	8·7
20	2649	90	Bh	2−3, =3	8·8
21	2650	50	Bn	3 (2) v (1) 4	9·1
22	2651	23	Bo	3 (1) v (1) 4	9·0
30	2659	90	Bh	3−4	9·2
Dec.					
7	2666	45	,,	3−6, 4−1	9·4
12	2671	150	,,	9+2	10·4
14	2673	94	Bl	7 (3) v (1) 10	10·7
21	2680	90	Bh	=12, =13	11·2
25	2684	,,	,,	12−2, =13, 16+5	11·3
31	2690	,,	,,	=16	11·7
1921					
Jan					
7	2697	,,	,,	=18, 20+1	12·2
10	2700	,,	,,	18−2, 20−1	12·4
10	2700	75	Bn	16 (4) v (1) 18, 19+1	12·1
12	2702	160	Bo	16 (3) v (1) 18	12·1
12	2702	94	Bl	16 (1·5) v (4·5) 18	11·8
13	2703	90	Bh	=20	12·3
19	2709	94	Bl	=16	11·7*b*
30	2720	90	Bh	=18, =20	12·2*b*
31	2721	120	Bn	18−1, 19−1	12·3
Feb.					
2	2723	90	Bh	=18, =20	12·2
9	2730	,,	,,	18−1, =20	12·3
16	2737	94	Bl	16 (3·5) v (1·5) 18	12·0
17	2738	90	Bh	16−8, 18−3, 20−3	12·5
17	2738	120	Bn	16 (3) v (1) 18	12·1
19	2740	160	Bo	16 (1) v (3) 18	11·8
20	2741	90	Bh	<18	<12·2
21	2742	,,	,,	16−3, 20+2	12·0

Oct. 16, Doubtful.
Oct. 24, D, Difficult.
Feb. 20, 25, Not seen.

(5237) R BOÖTIS—*continued.*

1921					
Feb					
23	2744	94	Bl	13 (3) v (1) 16	11·6
25	2746	90	Bh	<16	<11·7
Mar					
1	2750	120	Bn	10 (1) v (3) 13	11·0
2	2751	55	Bo	9 (1) v (3) 10	10·6
2	2751	90	Bh	12−1, =13, 16+4	11·3
2	2751	94	Bl	7 (3) v (1) 10	10·7
4	2753	80	Ca	14−2, 16+2	11·5
6	2755	90	Bh	12+2, 13+3	11·0
9	2758	55	Bo	6 (1) v (1) 7	9·9
10	2759	,,	,,	6 (1) v (3) 7	9·8
10	2759	50	Bn	6 (4) v (1) 7	10·0
10	2759	94	Bl	4 (5) v (2) 7	9·8
10	2759	90	Bh	9+2	10·4
11	2760	,,	,,	4−3, 6+1	9·6
14	2763	45	,,	4−1	9·3
15	2764	55	Bo	4 (4) v (1) 6	9·6
16	2765	90	Bh	=4	9·2
18	2767	50	Bn	4 (4) v (1) 6	9·6
20	2769	94	Bl	4 (1·5) v (4·5) 7	9·5
21	2770	55	Bo	4 (1) v (2) 6	9·4
21	2770	45	Bh	3−2, 4+2	9·0
24	2773	22	Bl	4 (2) v (3) 7	9·6
24	2773	45	Bh	3−2	9·0
24	2773	50	Bn	4 (1) v (1) 6	9·5
26	2775	,,	,,	4 (3) v (4) 6	9·4
28	2777	32	Ca	3−3, 4+1	9·1
29	2778	90	Bh	2−3, =3	8·8
30	2779	50	Bn	4+1	9·1
30	2779	55	Bo	2 (3) v (1) 3	8·7
30	2779	50	Ma	3+1	8·7
Apr					
1	2781	22	Bl	2 (4) v (1) 4	9·1
1	2781	45	Bh	2−1, 3+2	8·6
2	2782	55	Bo	2 (2) v (1) 3	8·7
3	2783	30	D	2+2	8·2
6	2786	,,	Bn	2 (4) v (1) 3	8·7
7	2787	45	Bh	2+2	8·2
7	2787	55	Bo	2 (2) v (3) 3	8·6
7	2787	32	Ca	2−1, 3+3	8·5
7	2787	60	Ms	=2	8·4
8	2788	50	Ma	=2, 3+2	8·5
8	2788	30	D	1 (5) v (1) 2, 2+3	8·2
10	2790	50	Ma	2+5, 3+7	8·0
11	2791	22	Bl	1 (8) v (1) 2, =2	8·3*b*
11	2791	30	D	1 (5) v (1) 2, 2+3	8·2
12	2792	45	Bh	1−12, 2+3	8·1
12	2792	30	Bn	2 (1) v (2) 3	8·6
12	2792	F	Bo	X (1) v (1) 2	8·2
14	2794	30	Ma	2+4, 3+5	8·2
14	2794	60	Ms	2+3	8·1
15	2795	,,	,,	1 (1) v (1) 2	7·7
15	2795	30	D	1 (4) v (1) 2, 2+4	8·1*b*
15	2795	45	Bh	1−10, 2+5	7·9
16	2796	22	Bl	1 (9) v (2) 2	8·2
17	2797	32	Ca	d−4, X+1	7·8
18	2798	F	Bo	=d	7·4*b*
23	2803	30	Bn	1 (3) v (1) 2	8·1
23	2803	45	Bh	1+1	6·8
25	2805	,,	,,	1+2	6·7
26	2806	,,	,,	1−1	7·0
26	2806	32	Ca	d−1, X+4	7·5
27	2807	30	Bn	1 (1) v (3) 2	7·3
27	2807	,,	D	1 (1) v (3) 2, 2−3	7·3
27	2807	22	Bl	1 (2) v (8) 2	7·2
28	2808	F	Bo	1 (3) v (1) d	7·3
28	2808	60	Ms	2+3	8·1
29	2809	30	D	1 (2) v (3) 2, 2−5	7·5
29	2809	45	Bh	=1	6·9
May					
1	2811	50	Ma	2+2	8·2
1	2811	30	Bn	1−2·5	7·2
3	2813	22	Bl	1 (1) v (7) 2	7·1
4	2814	32	Ca	=d	7·4*b*
5	2815	30	D	1 (1) v (2) 2, 2−5	7·4
7	2817	45	Bh	1−1	7·0
8	2818	30	Bn	1+1	6·8
9	2819	45	Bh	1−1	7·0
10	2820	F	Bo	1+1	6·8
12	2822	22	Bl	1 (1) v (8) 2	7·1
14	2824	32	Ca	1−4, d+1	7·3*b*
15	2825	45	Bh	=1	6·9
15	2825	30	Bn	1−1	7·0
16	2826	,,	D	1 (1) v (3) 2, 1−3·5	7·3
20	2830	,,	Bn	1 (1) v (3) 2	7·3
20	2830	22	Bl	1 (1) v (9) 2	7·1
21	2831	45	Bh	=1	6·9
22	2832	30	D	1 (2) v (3) 2, 1−6	7·5*b*
23	2833	50	Ma	2+6, 3+9	7·9
23	2833	45	Bh	=1	6·9
24	2834	30	Bn	1 (1) v (2) 2	7·4
27	2837	22	Bl	1 (2) v (7) 2	7·2
27	2837	30	D	1 (2) v (1) 2, 2+5	7·9
28	2838	,,	,,	1 (5) v (4) 2, 2+6	7·8
29	2839	,,	,,	1 (2) v (3) 2, 1−5	7·5
31	2841	,,	,,	1 (3) v (2) 2, 2+6	7·8
June					
1	2842	55	Bo	1−2	7·1*b*
2	2843	45	Bh	1−5, 2+10	7·4
5	2846	,,	,,	1−5, 2+10	7·4*b*
5	2846	30	D	1 (2) v (1) 2, 2+5	7·9
6	2847	,,	Bn	1 (2) v (1) 2	7·9
7	2848	,,	D	1 (3) v (2) 2, 2+6	7·8
9	2850	32	Ca	1−3, X+2	7·7
10	2851	45	Bh	1−7, 2+7	7·7
11	2852	30	Bn	1 (3) v (1) 2	8·1
11	2852	50	Ma	2+7, 3+8	7·9
11	2852	22	Bl	1 (5) v (5) 2	7·7
14	2855	55	Bo	=X	7·9
15	2856	30	Bn	2+3	8·1
16	2857	,,	D	1 (4) v (1) 2, 2+3·5	8·1
18	2859	45	Bh	1−10, 2+5	7·9
23	2864	,,	,,	1−12, 2+4	8·1
23	2864	30	Bn	2+2	8·2
24	2865	,,	D	2+2	8·2
24	2865	22	Bl	2+1	8·3
27	2868	45	Bh	2+3	8·1
28	2869	50	Bn	2+1·5	8·3
28	2869	30	D	2+1	8·3
28	2869	22	Bl	2 (1) v (3) 4, =2	8·6

Mar. 10, Bl, With 22, 10·0.
Mar. 20, With 22, 9·5.
Mar. 30, Ma, Whitish.
April 7, Ms, t.
April 8, Ma, Whitish.
April 10, Very difficult.
April 11, Bl, Uncertain.
April 14, 15, Ms, t. Same estimates with B.
April 28, Ms, With B, 8·1.
May 1, Ma, Very pale yellow.
May 21, 23, Bh, Yellow.
June 11, Ma, White.

(5237) R BOÖTIS—*continued.*

1921 June						1921 Dec					
29	2870	30	D	=2	8·4	24	3048	45	Bh	1−9, 2+7	7·8
July						30	3054	,,	,,	1−5, 2+10	7·4
4	2875	90	Bh	2−2, 3+2	8·6	1922					
4	2875	30	D	2−5, 3−1, 4+4	8·9	Jan					
5	2876	50	Ma	2−4, 3+1	8·8	1	3056	,,	,,	1−5, 2+10	7·4*b*
5	2876	32	Ca	2−3, =3	8·8*b*	3	3058	30	Bn	1 (7) v (2) 2	8·1
5	2876	50	Bn	2 (4) v (1) 3	8·7	4	3059	,,	D	1 (4) v (1) 2, 2+3	8·1
7	2878	22	Bl	2 (5) v (1) 4	9·1	6	3061	22	Bl	1 (5) v (5) 2	7·7
8	2879	30	D	3−3, 4+2	9·1	10	3065	45	Bh	1−8, 2+7	7·7
9	2880	50	Bn	3 (3) v (2) 4	9·1	18	3073	,,	,,	1−10, 2+5	7·9
10	2881	30	D	4−1	9·3	20	3075	,,	,,	1−10, 2+5	7·9
11	2882	90	Bh	3−2	9·0	23	3078	60	D	1 (4) v (1) 2, 2+3	8·1*b*
12	2883	50	Bn	6 (2) v (3) 7	9·8	23	3078	22	Bl	1 (9) v (2) 2	8·2
13	2884	30	D	4−3, 6+2	9·5	28	3083	45	Bh	=2	8·4*b*
17	2888	45	Bh	3−4	9·2	Feb					
21	2892	90	,,	9+6	10·0*b*	1	3087	22	Bl	2+1	8·3*b*
21	2892	50	Ma	9+2	10·4*b*	2	3088	45	Bh	2−1	8·5
25	2896	,,	Bn	7+1	10·0	4	3090	30	D	2−3, 3+2	8·7
26	2897	90	Bh	9+3	10·3	5	3091	55	Bo	2 (1) v (2) 3	8·6
30	2901	94	Bl	7−0·5	10·1	17	3103	50	Bn	4 (1) v (2) 6	9·4
Aug						17	3103	45	Bh	3−1, 4+2	9·0
3	2905	80	Ca	9−3, 10+1	10·8	18	3104	23	Bo	3 (3) v (2) 4	9·1
3	2905	50	Ma	9−2, 10+1, 13+2	10·9	20	3106	30	D	4−2, 6+3	9·4*b*
6	2908	45	Bh	=8, =9	10·5*b*	21	3107	22	Bl	4 (5) v (2) 7	9·8
9	2911	160	Bo	12 (1) v (3) 13	11·2	23	3109	32	Ca	6−2, 10+1	9·8
9	2911	75	Bn	13 (1) v (1) 16	11·5	25	3111	23	Bo	6 (2) v (2) 7	9·9
15	2917	90	Bh	=12, 13+1	11·2*b*	25	3111	30	D	4−3, 6+3	9·5
19	2921	45	,,	13−1	11·4	26	3112	,,	Bn	6 (3) v (1) 7	10·0
22	2924	90	,,	13−2, 16+2	11·5	26	3112	45	Bh	=4	9·2
23	2925	160	Bo	16 (1) v (1) 18	12·0	Mar					
25	2927	90	Bh	16−1, 20+4	11·8	2	3116	55	Bo	6 (3) v (1) 7	10·0
25	2927	79	Ma	13−4, 16−5, A+5	11·9	4	3118	45	Bh	=7	10·1
27	2929	94	Bl	16 (4) v (2) 18	12·0	7	3121	50	Bn	7 (2) v (1) 9	10·4
29	2931	79	Ma	=A	12·3	9	3123	94	Bl	7 (1) v (3) 10	10·3
30	2932	160	Bo	18 (1) v (1) 20	12·2	10	3124	45	Bh	=8, =9	10·5*b*
30	2932	90	Bh	20+1	12·2	15	3129	90	,,	=12, 13+1	11·2
Sept						17	3131	94	Bl	10 (2·5) v (3·5) 16	11·2
3	2936	75	Bn	18−1	12·3*b*	18	3132	275	Bo	13 (2) v (3) 16	11·5
4	2937	160	Bo	16 (2) v (1) 18	12·0	18	3132	80	Ca	13−2, 16+3	11·5
4	2937	80	Ca	16−3, 18+2	12·0	19	3133	90	Bh	13−3, 16+1	11·6
5	2938	94	Bl	16 (2) v (5) 20	11·9	22	3136	,,	,,	=16	11·7
5	2938	90	Bh	20−1	12·4	23	3137	140	Bo	13 (4) v (1) 16	11·6
7	2940	85	Bn	18−1, =19	12·2	25	3139	120	Bn	16 (1) v (2) 18	11·9
12	2945	160	Bo	16 (3) v (1) 18	12·1*b*	28	3142	90	Bh	16−4, 20+1	12·1
21	2954	90	Bh	20−1	12·4	Apr					
24	2957	,,	,,	20−1	12·4	1	3146	120	Bn	16 (2) v (1) 18, 19+2	12·0
24	2957	120	Bn	=18	12·2	4	3149	90	Bh	20−1	12·4
Oct.						6	3151	94	Bl	13 (3) v (1) 16, =16	11·7
1	2964	94	Bl	16 (5) v (1) 18 (1) 20	12·1	9	3154	90	Bh	=20	12·3
5	2968	120	Bn	16−2	11·9	16	3161	160	Bo	20−2	12·5*b*
5	2968	90	Bh	=16	11·7	17	3162	90	Bh	20−2	12·5
17	2980	,,	,,	9−3, 13+6	10·8	19	3164	94	Bl	16 (2) v (3) 20	11·9*b*
17	2980	94	Bl	4 (5) v (1) 7	9·9	19	3164	75	Bn	18−0·5, 19−1	12·3
23	2986	90	Bh	4−7, 7+2	9·9	20	3165	275	Bo	t (1) v (3) u	12·7*b*
23	2986	50	Bn	6 (1) v (2) 7	9·8	23	3168	90	Bh	20−2	12·5
30	2993	25	,,	4 (1) v (1) 6	9·5	28	3173	94	Bl	16−3·5, 20−1·5	12·2
Nov						29	3174	90	Bh	20−1	12·4
4	2998	50	,,	4 (1) v (3) 6	9·4	May					
6	3000	,,	,,	4 (2) v (3) 6	9·4	2	3177	,,	,,	20−1	12·4
6	3000	90	Bh	=4	9·2	2	3177	120	Bn	18−1·5, 19−2	12·4
10	3004	94	Bl	2 (4) v (3) 4	8·9	4	3179	140	Bo	t−1	12·7*b*
10	3004	50	Bn	4 (1) v (3) 6	9·4	6	3181	94	Bl	16 (1) v (5) 20	11·8
11	3005	90	Bh	2−4, 4+5	8·8*b*	6	3181	90	Bh	=20	12·3*b*
24	3018	,,	,,	=2	8·4	8	3183	,,	,,	16−3, 20+1	12·1*b*
Dec						12	3187	,,	,,	16−3, 20+2	12·0
4	3028	45	,,	2+3	8·1	13	3188	120	Bn	16 (3) v (1) 19	12·1
15	3039	,,	,,	1−10, 2+6	7·9	13	3188	80	Ca	16−3, 18+2	12·0
23	3047	30	Bn	1 (2) v (1) 2	7·9	14	3189	140	Bo	16 (2) v (3) 20	11·9

(5237) R BOÖTIS—*continued.*

1922					
May					
16	3191	160	Bo	16 (2) v (4) 20	11·9
17	3192	90	Bh	=16	11·7
19	3194	45	,,	13−2, 16+2	11·5*b*
20	3195	31	D	13−3	11·6*b*
20	3195	94	Bl	13 (2·5) v (1·5) 16	11·6
21	3196	160	Bo	13 (3) v (2) 16	11·6*b*
21	3196	50	Bn	13 (3) v (1) 16	11·6
23	3198	80	Ca	13−3, 16+2	11·6
26	3201	45	Bh	=12, =13	11·2*b*
27	3202	90	,,	=12, 13+2	11·1
27	3202	160	Bo	13 (2) v (3) 16	11·5
28	3203	62	D	10−1, 13+3	11·0
28	3203	94	Bl	7 (2) v (1) 10	10·6
June					
1	3207	50	Bn	7 (3) v (1) 8	10·4
4	3210	90	Bh	10+2	10·7
12	3218	,,	,,	7−3, 9+2	10·4*b*
15	3221	22	Bl	4 (6) v (2) 7	9·9
16	3222	55	Bo	4 (3) v (2) 6	9·5
19	3225	45	Bh	=7	10·1*b*
23	3229	32	Ca	4−1, =5	9·3
26	3232	45	Bh	2−5, 3−2	9·0*b*
29	3235	22	Bl	2 (4) v (1) 4, =4	9·1
29	3235	45	Bh	=2, =3	8·6*b*
30	3236	,,	,,	=2	8·4*b*
July					
1	3237	55	Bo	2 (2) v (2) 3	8·6
2	3238	45	Bh	=2	8·4
2	3238	32	Ca	2−2, 3+1	8·7
9	3245	,,	,,	2−1, 3+2	8·6
10	3246	45	Bh	1−10, 2+5	7·9
12	3248	22	Bl	1 (7) v (1) 2	8·2
14	3250	45	Bh	1−3	7·2
17	3253	F	Bo	d (2) v (3) X	7·6*c*
18	3254	30	Bn	1 (1) v (3) 2	7·3
20	3256	45	Bh	1+1	6·8
27	3263	,,	,,	1−1	7·0
27	3263	32	Ca	=d	7·4
28	3264	30	Bn	1−1	7·0
29	3265	55	Bo	1−1	7·0
30	3266	30	Bn	=1	6·9
31	3267	45	Bh	=1	6·9
Aug					
5	3272	,,	,,	=1	6·9
7	3274	30	Bn	1+1	6·8
11	3278	45	Bh	1−1	7·0
12	3279	32	Ca	1 (3) v (7) X	7·2
15	3282	30	Bn	1+1·5	6·8
17	3284	45	Bh	1−5, 2+10	7·4
18	3285	,,	,,	1−5, 2+10	7·4
19	3286	F	Bo	1−3	7·2
20	3287	30	Bn	1+2	6·7
22	3289	32	Ca	1 (5) v (5) X	7·4
23	3290	30	Bn	1−2	7·1
23	3290	50	Ma	2+4	8·0
23	3290	45	Bh	1−8, 2+7	7·7
25	3292	,,	,,	1−6, 2+9	7·5
25	3292	30	Bn	1−2	7·1
27	3294	F	Bo	X (1) v (4) 2	8·0*b*
30	3297	32	Ca	1 (9) v (1) X	7·8
31	3298	30	Bn	1 (1) v (2) 2	7·4
31	3298	45	Bh	2+6	7·8
Sept					
3	3301	32	Ca	X (1) v (5) 2	8·0
7	3305	90	Bh	2+5	7·9
9	3307	30	Bn	2+2	8·2
10	3308	90	Bh	2+1	8·3
12	3310	32	Ca	2 (1) v (3) 3	8·5
1922					
Sept					
15	3313	30	Bn	2+1	8·3
15	3313	90	Bh	2−1, 3+2	8·6
18	3316	22	Bl	2+1·5	8·3
21	3319	90	Bh	2+1	8·3
24	3322	50	Bn	2 (2) v (1) 3	8·7
26	3324	90	Bh	2−1, 3+1	8·6
Oct					
4	3332	,,	,,	3−2, 4+2	9·0
6	3334	,,	,,	=4	9·2
6	3334	94	Bl	=4	9·2*b*
8	3336	32	Ca	4 (4) v (1) 6	9·6
12	3340	50	Bn	6 (2) v (1) 7	10·0
14	3342	,,	,,	6 (3) v (1) 7	10·0
14	3342	90	Bh	4−3	9·5
17	3345	34	Li	5 (5) v (5) 6	9·5
20	3348	90	Bh	6−3, =7	10·0
22	3350	50	Bn	7 (2) v (5) 9	10·2
25	3353	94	Bl	7 (2) v (2) 10	10·5
25	3353	45	Bh	=9	10·6
Nov					
1	3360	90	,,	12−2, 13+1	11·3*b*
4	3363	,,	,,	12−2, 13−1	11·4
9	3368	,,	,,	12−5, 13−3	11·6
15	3374	94	Bl	13 (2) v (2) 16	11·5
15	3374	120	Bn	10 (3) v (1) 13	11·2*b*
18	3377	90	Bh	<13	<11·3
24	3383	,,	,,	16+1	11·6
Dec					
11	3400	,,	,,	16−4, 20+2	12·1*b*
16	3405	150	,,	13−3, 16+1	11·6
20	3409	75	Bn	=16	11·7
1923					
Jan.					
11	3431	90	Bh	6−2, 7+2	9·9
14	3434	22	Bl	4 (5) v (1) 7, =7	10·0*b*
16	3436	,,	,,	4 (3) v (3) 7	9·7
20	3440	30	Bn	4 (5) v (1) 6	9·6
27	3447	32	Ca	4 (2) v (2) 6	9·5
27	3447	90	Bh	4−1, 6+3	9·4
Feb					
4	3455	45	,,	2−2, 3+1	8·7
6	3457	22	Bl	2 (1) v (4) 4	8·6
8	3459	45	Bh	2+1	8·3
14	3465	32	Ca	X (1) v (4) 2	8·0
17	3468	22	Bl	1 (8) v (3) 2	8·0
18	3469	90	Bh	1−10, 2+5	7·9
23	3474	45	,,	1−5, 2+10	7·4
26	3477	22	Bl	1+0·5	6·9*b*
Mar					
2	3481	45	Bh	1−4	7·3
5	3484	,,	,,	2+10	7·4
6	3485	30	Bn	1 (1) v (2) 2	7·4
7	3486	32	Ca	1 (3) v (7) X	7·2
13	3492	45	Bh	1+1	6·8
17	3496	,,	,,	1+1	6·8
17	3496	30	Bn	1+1	6·8
18	3497	B	Ca	1 (2) v (3) d	7·1
20	3499	22	Bl	a (7) v (1) 1	6·8
21	3500	45	Bh	=1	6·9
24	3503	50	Bn	1 (1) v (3) 2	7·3
24	3503	B	Ca	1 (2) v (3) d	7·1
24	3503	22	Bl	=1	6·9
25	3504	45	Bh	1−1	7·0
26	3505	31	D	1 (3) v (2) 2, 2+6	7·8

Oct. 6, Bl, With 22, 9·5*b*.
Nov. 18, Not seen. Considered <11·5.

(5237) R BOÖTIS—*continued.*

1923					
Apr					
1	3511	90	Bh	1−5, 2+10	7·4
4	3514	50	Bn	1 (3) v (1) 2	8·1
4	3514	32	Ca	1 (2) v (3) d	7·1
4	3514	22	Bl	1 (6) v (4) 2	7·8
8	3518	31	D	1 (6) v (1) 2, 2+2	8·2
8	3518	50	Ma	2+5	7·9
8	3518	45	Bh	1−10, 2+5	7·9
9	3519	30	Bn	2+2	8·2
12	3522	32	Ca	X (1) v (4) 2	8·0
13	3523	90	Bh	2+3	8·1
14	3524	34	Li	1 (7) v (3) 2	8·0
14	3524	30	D	=2	8·4
14	3524	50	Ma	=2	8·4
17	3527	90	Bh	2−1	8·5
18	3628	32	Ca	X (4) v (1) 2	8·3
20	3530	22	Bl	=2	8·4
20	3530	30	Bn	2 (2) v (1) 3	8·7
22	3532	90	Bh	2−4, 3−2	8·9
23	3533	30	D	2−3, 3+1	8·7
26	3536	,,	Bn	2 (5) v (1) 3	8·7
26	3536	34	Li	2 (5) v (5) 3	8·6*b*
26	3536	50	Ma	2−2, 3+1	8·7
27	3537	30	D	3+0·5	8·7
27	3537	45	Bh	3−5	9·3
May					
1	3541	,,	,,	4−5, 7+1	9·9
2	3542	32	Ca	=5	9·3
4	3544	60	D	4−2, 6+3	9·4
4	3544	30	Bn	4 (2) v (1) 6	9·5
8	3548	32	Ca	=6	9·7
8	3548	45	Bh	7−1	10·2
9	3549	50	Ma	2 (3) v (1) 9, 10+6	10·1
10	3550	22	Bl	4 (5) v (1) 7	9·9
12	3552	50	Bn	4 (5) v (1) 6	9·6
12	3552	34	Li	=6	9·7
13	3553	30	D	6−2, 7+2	9·9
17	3557	90	Bh	9+1	10·5
24	3564	60	D	7−1, 9+4	10·2
24	3564	94	Bl	=7	10·1
30	3570	90	Bh	9−5, 10−2	11·1
June					
2	3573	,,	,,	12+1, 13+1	11·1
6	3577	94	Bl	=13	11·3
6	3577	60	D	10−1, 13+3	11·0
10	3581	,,	,,	13−1, 16+4	11·4*b*
11	3582	90	Bh	12−2, 16+4	11·3*b*
18	3589	94	Bl	=16	11·7
18	3589	60	D	13−3, 16+1	11·6
23	3594	90	Bh	13−6, 16−2	11·9
29	3600	79	Ma	16−1	11·8*b*
30	3601	90	Bh	16−3, 20+3	12·0*b*
July					
5	3606	,,	,,	20+1	12·2
5	3606	94	Bl	16 (2) v (4) 20	11·9
6	3607	60	D	13−3, 16+2	11·6
6	3607	120	Bn	16 (1) v (1) 18	12·0
10	3611	94	Bl	16 (1) v (5) 20	11·8
14	3615	90	Bh	=20	12·3
19	3620	120	Ga	=17	11·9
20	3621	90	Bh	20+2	12·1
21	3622	94	Li	16 (5) v (5) 18	12·0
30	3631	90	Bh	13−7, 16−3, 20+3	12·0
Aug					
1	3633	,,	,,	12−2, =13	11·3
1923					
Aug					
3	3635	90	Bh	12−2, =13, 16+4	11·3
3	3635	120	Ga	13−5, =16	10·8
3	3635	108	Ma	13+1, 16+2	11·4
4	3636	120	Bn	10 (3) v (1) 13	11·2
8	3640	32	Ca	9 (2) v (1) 10	10·8
9	3641	90	Bh	=10, 12+3	10·9
10	3642	120	Ga	10−3, 12+2	11·1
11	3643	50	Bn	9 (2) v (1) 10	10·8
11	3643	60	D	10−2, 13+3	11·0
15	3647	51	Ma	9+1, 10+3	10·5*b*
15	3647	45	Bh	4−6, 7+1	9·9
18	3650	,,	,,	3−1, 4−3	9·6
21	3653	50	Bn	6 (5) v (2) 7	10·0*b*
26	3658	90	Bh	3−2	9·0
30	3662	45	,,	2−2, 3+2	8·6
30	3662	50	Bn	3 (4) v (3) 4	9·0
30	3662	51	Ma	2 (1) v)1) 9	9·5
Sept					
1	3664	60	D	3−0·5, 4+3	8·9
2	3665	45	Bh	2−2, 3+2	8·6
3	3666	22	Bl	2 (3) v (3) 4	8·8
5	3668	50	Bn	2 (1) v (1) 3	8·6
6	3669	,,	Ma	2 (1) v (1) 9, 3+1	9·1
7	3670	32	Ca	2 (2) v (2) 3	8·6
7	3670	45	Bh	2+1	8·3
8	3671	30	D	2−3, 3+1	8·7
9	3672	50	Ma	2−3, 3+3	8·6
9	3672	90	Bh	2+1	8·3*b*
11	3674	,,	,,	=2	8·4
11	3674	50	Bn	2+1	8·3
12	3675	30	D	2−1, 3+3	8·5
13	3676	90	Bh	2+3	8·1
15	3678	50	Bn	2+1·5	8·3
15	3678	22	Bl	2+0·5	8·4*b*
16	3679	90	Bh	2+5	7·9
21	3684	25	Bn	1 (4) v (1) 2	8·1
22	3685	90	Bh	1−10, 2+5	7·9
25	3688	32	Ca	X (1) v (4) 2	8·0
26	3689	45	Bh	1−3, 2+12	7·2
29	3692	50	Bn	1 (2) v (1) 2	7·9
30	3693	60	Ga	1−10, 2+10	7·7*b*
30	3693	30	D	1 (2) v (1) 2, 2+6	7·9
Oct					
1	3694	45	Bh	1−5, 2+10	7·4
5	3698	,,	,,	1−5, 2+10	7·4
9	3702	,,	,,	1−1	7·0
11	3704	,,	,,	=1	6·9
11	3704	60	Ga	=1	6·9
14	3707	32	Ca	1 (1) v (9) X	7·0
14	3707	50	Bn	1 (1) v (2) 2	7·4
19	3712	45	Bh	1+1	6·8
22	3715	32	Ca	b (6) v (1) 1	6·8
22	3715	50	Bn	1 (1) v (1) 2	7·7
23	3716	45	Bh	=1	6·9
27	3720	32	Ca	1 (1) v (9) X	7·0
Nov					
2	3726	22	Bl	1 (1) v (9) 2	7·1
3	3727	50	Bn	1 (2) v (1) 2	7·9
4	3728	30	D	1 (3) v (2) 2, 2+6	7·8
7	3731	50	Bn	1 (3) v (1) 2	8·1
7	3731	45	Bh	1−5	7·4
9	3733	,,	,,	1−5, 2+10	7·4
10	3734	22	Bl	1 (8) v (1) 2	8·3

June 10, Difficult.
June 29, Very difficult.

Aug. 30, Ma, Whitish.
Sept. 30, Ga, T.
Oct. 11, Ga, T.

(5237) R BOÖTIS—*continued.*

1923						1924					
Nov						Mar					
14	3738	50	Bn	2+2	8·2	7	3852	120	Bn	16 (2) v (1) 19	12·0
19	3743	,,	,,	2+3	8·1	7	3852	90	Bh	16 (2) v (1) 18	12·0
19	3743	45	Bh	2+4	8·0	8	3853	60	D	16−2, 18+3	11·9*b*
22	3746	32	Ca	X (1) v (4) 2	8·0	9	3854	90	Bh	16−1	11·8
29	3753	30	Ry	2−3, 3+5	8·5	11	3856	60	D	16−2, 18+3	11·9
Dec						12	3857	94	Bl	13 (5) v (1) 16	11·7
4	3758	90	Bh	4+1	9·1	14	3859	50	Ry	13−2, 16+1	11·6
9	3763	30	Ry	3−1·5, 4+2	9·0	14	3859	90	Bh	13 (2) v (1) 16	11·6
11	3765	,,	,,	3−4, =4, 6+4·5	9·2	19	3864	,,	,,	13−1	11·4
15	3769	32	Ca	5 (4) v (4) 7	9·7	22	3867	,,	,,	13+1	11·2
16	3770	30	Ry	4−4, 6+2	9·6	26	3871	,,	,,	=9	10·6*b*
18	3772	45	Bh	=4	9·2*b*	26	3871	32	Ca	13 (1) v (3) 16	11·4
20	3774	94	Bl	4 (2) v (5) 7	9·5	29	3874	,,	Bn	9 (2) v (1) 10	10·8
24	3778	50	Ry	6−1, 8+4	9·9	29	3874	,,	Ma	=9	10·6
24	3778	,,	Bn	6 (1) v (3) 7	9·8	29	3874	94	Bl	7 (4) v (1) 10	10·7
24	3778	90	Bh	4−2, 7+6	9·5	29	3874	90	Bh	9+1	10·5
28	3782	45	,,	4−4, 7+4	9·7	30	3875	60	D	7−1, 9+4	10·2
31	3785	30	Ry	=8	10·5*c*	Apr					
1924						1	3877	50	Bn	7 (7) v (2) 9	10·5
Jan						2	3878	90	Bh	9+1	10·5
2	3787	50	,,	8−1·5, =9	10·6	3	3879	50	Ry	9−0·5, 8+3·5	10·4*b*
3	3788	45	Bh	7−6, 9−2	10·7	4	3880	60	D	4−4, 6+1	9·6
5	3790	90	,,	9−3, 12+3	10·9	4	3880	32	Ca	7 (3) v (1) 8	10·4
6	3791	50	Bn	7 (5) v (1) 8	10·4	4	3880	50	Bn	7 (3) v (2) 9	10·4
6	3791	94	Bl	7 (2) v (2) 10, 7 (2·5) v (1·5) 10	10·5*b*	5	3881	,,	Ma	8+3, 11+3, 10+5	10·4
						6	3882	32	Ca	7 (2) v (2) 8	10·3
14	3799	120	Bn	13 (2) v (1) 16	11·6	6	3882	90	Bh	4 (2) v (1) 7	9·8
15	3800	94	Bl	13 (3) v (1) 16	11·6	7	3883	50	Bn	6 (5) v (1) 7	10·0
16	3801	90	Bh	=16	11·7	7	3883	22	Bl	4 (6) v (2) 7	9·9
17	3802	80	Ry	13−2, 16−1	11·7	9	3885	32	Ca	6 (3) v (1) 7	10·0
23	3808	90	Bh	=18, =20	12·2	9	3885	50	Ma	9+3, 10+5	10·3
26	3811	,,	,,	=18, =20	12·2	9	3885	,,	Bn	6−2·5, 7+1·5, 9+5	10·0
28	3813	94	Bl	13 (4·5) v (1·5) 16	11·6	11	3887	90	Bh	4 (1) v (1) 7	9·7
29	3814	50	Ry	16−3, =19	12·1*b*	11	3887	60	D	6−1, 7+3	9·8
31	3816	90	Bh	18−1, =20	12·3	12	3888	30	Ry	6−1, 9+5	9·9
Feb						14	3890	22	Bl	4 (6) v (2) 7	9·9
1	3817	60	D	16−3, 18+2	12·0*b*	14	3890	32	Ca	=6	9·7
1	3817	120	Bn	16 (3) v (1) 18, 19+1, 20+1·5	12·1	14	3890	45	Bh	4+1	9·1
						20	3896	,,	,,	3 (1) v (1) 4	9·0
3	3819	50	Ry	=19	12·2*b*	20	3896	50	Bn	3 (4) v (1) 4	9·1
8	3824	60	D	16−5, =18	12·2*b*	21	3897	32	Ca	=5	9·3
11	3827	90	Bh	18−3, 20−2	12·5	23	3899	,,	,,	=4	9·2
14	3830	60	D	16−3, 18+2	12·0*b*	25	3901	30	D	=3	8·8
14	3830	120	Bn	18+1, 19+1, 20+2	12·1	25	3901	45	Bh	3−1	8·9
14	3830	94	Bl	16 (3) v (3) 20	12·0	27	3903	32	Ca	3 (2) v (2) 4	9·0
14	3830	90	Bh	20−3	12·6	May					
18	3834	,,	,,	18−3, 20−1	12·4	1	3907	30	D	2 (3) v (2) 3	8·6
22	3838	,,	,,	20−3	12·6	3	3909	45	Bh	1 (3) v (2) 2	7·8
24	3840	,,	,,	18−2, 20−2	12·4	4	3910	30	D	2 (2) v (3) 3	8·6
27	3843	,,	,,	16−7, 18−2, 20−2	12·4	5	3911	25	Bn	2+2	8·2
28	3844	94	Bl	16 (2) v (5) 20	11·9	5	3911	50	Ma	2 (1) v (4) 9, 3+4	8·7
29	3845	80	Ry	19+1, =20, t+3	12·2	5	3911	45	Bh	1 (1) v (2) 2	7·4
Mar						7	3913	30	D	2+1	8·3
2	3847	90	Bh	=18, =20	12·2	7	3913	22	Bl	2+1	8·3
2	3847	80	Ca	16 (2) v (3) 18	11·9	8	3914	32	Ca	e (2) v (1) f	8·1
4	3849	60	D	16−3	12·0*b*	9	3915	30	D	1 (4) v (1) 2, 2+2·5	8·2
4	3849	120	Bn	16 (3) v (1) 19, 18+2	12·0	11	3917	32	Ca	=e	7·9
6	3851	94	Bl	13 (5) v (1) 16, =16	11·7*b*	13	3919	30	D	1 (3) v (1) 2, 2+4	8·1
						13	3919	22	Bl	1 (7) v (3) 2	8·0

Nov. 29, Dec. 9, 11, t.
Dec. 16, t.
Dec. 24, Ry, T.
Dec. 31, t.
Jan. 2, T.
Jan. 29, t.
Feb. 3, T.
Feb. 14, D, About.

Mar. 14, Ry, T.
Mar. 29, Bl, With 22, 11·0.
April 3, T.
April 5, Date somewhat uncertain.
April 12, t.
May 9, 5c.
May 13, D, 4c.

(5237) R BOÖTIS—*continued.*

1924					
May					
13	3919	45	Bh	1+1	6·8
16	3922	,,	,,	1+1	6·8
16	3922	32	Ca	1 (6) v (4) X	7·5
16	3922	25	Bn	1−2	7·1
21	3927	30	D	1+1	6·8
22	3928	45	Bh	1+2	6·7
23	3929	32	Ca	1 (3) v (7) X	7·2
23	3929	30	D	1+1	6·8
24	3930	22	Bl	a (7) v (1) 1	6·8
25	3931	30	D	a (6) v (1) 1, 1+2	6·7
26	3932	45	Bh	1+2	6·7
27	3933	30	D	a (4) v (1) 1, 1+2	6·7
27	3933	25	Bn	1+2	6·7
28	3934	45	Bh	1+3	6·6
29	3935	32	Ca	b (6) v (1) 1	6·8
30	3936	30	D	a (5) v (1) 1, 1+2	6·7
30	3936	20	Ry	1−0·5	7·0
June					
1	3938	30	D	1+2	6·7
3	3940	22	Bl	a (5) v (3) 1	6·5
5	3942	30	D	1+1	6·8
8	3945	32	Ca	1−1	7·0
9	3946	30	D	1−1	7·0
13	3950	25	Bn	1−2	7·1
13	3950	45	Bh	1+1	6·8
15	3952	30	D	1+1	6·8*b*
16	3953	22	Bl	a (6) v (1) 1, =1	6·8
17	3954	30	D	1−1	7·0
18	3955	45	Bh	1 (1) v (2) 2, 1−1	7·3
20	3957	25	Bn	1−3	7·2
21	3958	30	D	1 (1) v (4) 2, 1−3	7·2
23	3960	,,	,,	1 (1) v (1) 2	7·7
24	3961	50	Ma	2+4, 3+6	8·1
26	3963	30	D	1 (3) v (1) 2, 2+3	8·1
26	3963	45	Bh	1 (1) v (2) 2	7·4
26	3963	32	Ca	X (1) v (4) 2	8·0*b*
29	3966	22	Bl	1 (6) v (4) 2	7·8
30	3967	30	D	1 (4) v (1) 2, 2+2	8·2*b*
30	3967	45	Bh	1 (2) v (3) 2	7·5
July					
2	3969	,,	,,	1 (1) v (1) 2	7·7
4	3971	32	Ca	X (2) v (3) 2	8·1
5	3972	30	D	2+1	8·3*b*
6	3973	,,	,,	2−1	8·5
6	3973	22	Bl	1 (9) v (1) 2	8·3
9	3976	30	D	2−1, 3+3	8·5
9	3976	90	Bh	2+5	7·9*b*
9	3976	50	Ma	2 (1) v (9) 9, 2−2	8·6
10	3977	25	Bn	2+2	8·2
10	3977	32	Ca	X (4) v (1) 2	8·3
11	3978	30	D	2 (3) v (2) 3	8·6
12	3979	22	Bl	2 (4) v (1) 4	9·1
13	3980	50	Bn	2+1	8·3
14	3981	45	Bh	=2	8·4
19	3986	50	Bn	3 (1) v (4) 4	8·9
24	3991	,,	,,	3 (3) v (1) 4	9·1

May 21, 3^{c}.
May 23, D, 3^{c}.
May 25, 27, D, 6^{c}.
May 30, D, 4^{c}. Ry, t.
June 1, 3^{c}.
June 5, 4^{c}·5.
June 9, 4^{c}.
June 15, Difficult.
June 23, 26, D, 5^{c}.
June 24, July 9, Ma, Pale yellow.

1924					
July					
24	3991	90	Bh	3−1	8·9
26	3993	94	Bl	4+0·5	9·2*b*
29	3996	50	Bn	4 (3) v (2) 6	9·5
29	3996	,,	Ma	2 (3) v (2) 9	9·7
30	3997	32	Ca	5 (2) v (2) 6	9·5
30	3997	45	Bh	3 (2) v (1) 4	9·1
Aug					
2	4000	50	Bn	6+1	9·6
3	4001	30	Ry	6−1·5, =7	10·0
7	4005	90	Bh	7 (1) v (2) 9	10·3
7	4005	50	Ma	9+3, 10+4	10·4
7	4005	,,	Bn	7 (1) v (2) 9	10·3
9	4007	94	Bl	4 (5) v (2) 7	9·8
10	4008	60	D	7−3, 9+2	10·4*b*
12	4010	50	Bn	7 (2) v (3) 9	10·3
15	4013	45	Bh	=9	10·6*b*
17	4015	60	D	9−1	10·7
18	4016	55	Ry	=10, 16+2	11·2*b*
18	4016	79	Ma	9−2, 10+2, 13+3	10·8
19	4017	50	Bn	10+1·5	10·7
19	4017	90	Bh	13+1	11·2*b*
28	4026	,,	,,	16−1	11·8*b*
31	4029	,,	,,	=18	12·2
31	4029	...	Ry	=16	11·7*b*
Sept					
2	4031	90	Bh	16−5, =18	12·2
8	4037	,,	,,	=18, =20	12·2
9	4038	120	Bn	16 (4) v (1) 18	12·1
12	4041	155	Ry	=19, =20	12·2
16	4045	90	Bh	20−2	12·5
23	4052	120	Bn	18−1, 19−1	12·3*b*
26	4055	90	Bh	16−5, 20−1	12·3
27	4056	120	Bn	t−1	12·7
27	4056	90	Ry	t−2, u+3	12·8
Oct					
1	4060	,,	Bh	16−5	12·2
6	4065	,,	,,	16 (2) v (1) 20	12·1*b*
8	4067	120	Bn	<20, <A	<12·3
15	4074	90	Bh	20+1	12·2
16	4075	80	Ry	=19, 20+1	12·2*b*
24	4083	90	Bh	16 (2) v (1) 20	12·1*b*
31	4090	,,	,,	13 (1) v (2) 16	11·4
Nov					
2	4092	,,	,,	=13	11·3
3	4093	120	Bn	13 (1) v (1) 16	11·5
5	4095	90	Bh	=12, 13+2	11·1
10	4100	45	,,	9 (1) v (2) 13	10·8*b*
15	4105	90	,,	9 (1) v (1) 13	10·9
22	4112	32	Ca	=6	9·7
24	4114	90	Bh	=7, 9+3	10·2
Dec					
1	4121	,,	,,	3 (2) v (1) 4	9·1
4	4124	,,	,,	2 (2) v (1) 3	8·7
4	4124	30	Ry	4−1, 5−1	9·4
5	4125	32	Ca	3 (3) v (1) 4	9·1
6	4126	30	D	3−3, 4+1·5	9·1
9	4129	34	Li	=4	9·2
13	4133	45	Bh	2+2	8·2
17	4137	30	Ry	2−4, 3+1	8·8

July 26, With 22, 9·9.
Aug. 3, T.
Aug. 18, 31, Ry, 4-in. OG.
Sept. 12, 16-in. OG.
Sept. 27, Ry, 16-in. OG.
Oct. 8, Not seen.
Dec. 4, Ry, t.

(5237) R BOÖTIS—*continued.*

1924 Dec						1924 Dec					
19	4139	45	Bh	1 (3) v (1) 2	8·1	28	4148	45	Bh	1 (2) v (1) 2	7·
20	4140	32	Ca	2 (2) v (2) 3	8·6	28	4148	50	Bn	2+1	8·
22	4142	30	D	2 (4) v (1) 3	8·7	28	4148	30	Ry	=2, 3+4	8·
24	4144	50	Bn	2 (2) v (1) 3	8·7	30	4150	,,	D	2−2, 3+2	8·
24	4144	45	Bh	1 (3) v (1) 2	8·1	31	4151	45	Bh	1 (1) v (1) 2	7·

(5157) S BOÖTIS. (V. 2.)

H.D. 141954.

Star A = Hagen's 5 and 6 combined
= B.D. + 54° 1666, 8^{m}·12, **H.A., 37,** 17.

Hagen's 9 is H.C.O. B, 10^{m}·27. It has been assigned the value 10^{m}·00, as this was the figure, obtained by grades, given on the list issued to observers.

For a similar reason Hagen's 14, which is H.C.O. C (10^{m}·39) has been rated as 10^{m}·48

Date.	Julian Date.	Inst.	Observer.	Comparisons.	Deduced Mag.	Date.	Julian Date.	Inst.	Observer.	Comparisons.	Deduced Mag.
1919 May						1920 June					
10	2089	60	D	k−3, l+2	11·4	22	2498	30	D	11−3, 15+3	10·
18	2097	,,	,,	=15	10·6	July					
26	2105	30	,,	11−4, 15+2	10·5	9	2515	60	,,	=15	10·
31	2110	,,	,,	7−3, 11+2	10·0	19	2525	,,	,,	15−3, k+2	10·
June						Sept					
7	2117	,,	,,	=7, 11+5	9·7	4	2572	130	Mn	=27	12·
12	2122	,,	,,	e−6, 7+1	9·6	10	2578	117	Gi	25−3, 27+1	12·
16	2126	,,	,,	e−5, 7+2	9·5	15	2583	80	AB	25−3	12·
July						18	2586	130	Mn	27 (1) v (1) 28	13·
3	2143	,,	,,	4−2, d+3	8·5	29	2597	,,	,,	<22	<12·
14	2154	,,	,,	4−2, d+3	8·5	Oct					
Aug						3	2601	80	AB	<22	<12·
14	2185	,,	,,	d−2, e+1	9·0	6	2604	117	Gi	25−2·5	12·
18	2189	,,	,,	e−3, 7+4	9·3	11	2609	60	Mn	25 (1) v (2) 27	12·
24	2195	,,	,,	e−4, 7+2	9·5	15	2613	80	AB	<22	<12·
Sept						23	2621	130	Mn	22−0·5	12·
7	2209	,,	,,	7−1, 11+4	9·8	28	2626	117	Gi	15−9, 22+3	11·
18	2220	,,	,,	7−3, 11+2	10·0*b*	29	2627	60	Mn	19 (2) v (1) 21	11·
1920 Jan						31	2629	80	AB	15 (4) v (3) l	11·
14	2338	,,	,,	<15	<10·6*b*	Nov					
Feb						3	2632	55	Bo	19 (1) v (3) 21	11·
16	2371	60	,,	15−1, k+5	10·7	5	2634	60	Co	17−2	11·
23	2378	30	,,	=C, 11−3, 15+2	10·4	7	2636	55	Bo	=19	11·
Mar						10	2639	60	Co	15−3, =17	10·
12	2396	,,	,,	7+1	9·6*b*	16	2645	,,	,,	15−2, =17	10·
18	2402	,,	,,	e−2, 7+4	9·3	16	2645	117	Gi	15+1	10·
22	2406	,,	,,	=e	9·1	17	2646	160	Bo	14 (3) v (1) 15	10·
Apr						18	2647	32	Mn	=11	10·
6	2421	,,	,,	4−2, d+2	8·6	22	2651	55	Bo	10 (3) v (1) 11	10·
11	2426	,,	,,	4−3, =d	8·7	Dec					
21	2436	,,	,,	4−3, d+1	8·7	9	2668	60	Co	7+1	9·
May						10	2669	,,	,,	=7	9·
7	2452	,,	,,	d−2, e+1	9·0	12	2671	,,	Mn	=7	9·
10	2455	,,	,,	e 1, 7+5	9·2	14	2673	,,	Co	7+1	9·
14	2459	,,	,,	2−3·5, 7+3	9·4	28	2687	48	Bg	5−4, 7+5	9·
June											
8	2484	,,	,,	=11	10·2						
10	2486	,,	,,	11+1	10·1*b*						

July 19, Difficult.
Nov. 5, About.
Dec. 10, About.

(5157) S BOÖTIS—*continued.*

1921 Jan					
2	2692	90	Mn	6−2	9·0*c*
4	2694	47	Gi	4−3·5	8·7
9	2699	22	Ni	4 (3) v (4) 7	8·9
4	2704	55	Bo	4 (1) v (3) 5	8·5
5	2705	90	Mn	4−2·5, 5+1	8·7
6	2706	22	Ni	4 (1) v (5) 7	8·6
6	2706	80	AB	4−3, e+3	8·8
9	2709	47	Gi	4−1, 6+3	8·5
4	2714	45	Bh	2−6, 4+4	8·0
5	2715	32	Ca	3−4, 4+1	8·3
7	2717	45	Bh	2−6, 4+4	8·0
0	2720	,,	,,	5+5	8·3
1	2721	80	AB	4−2, e+5	8·6
1	2721	48	Wi	2−12, 4−3	8·6*b*
eb					
1	2722	,,	,,	=4	8·4*b*
1	2722	55	Bo	3 (2) v (1) 4	8·2
2	2723	45	Bh	2−8, 4+2	8·2
2	2723	32	Mn	4−1, 5+3	8·5*b*
3	2724	60	Co	=4	8·4
3	2724	48	Wi	=4	8·4
4	2725	47	Gi	4−1·5, 5+4	8·5
5	2726	55	Bo	4 (3) v (1) 5	8·7
9	2730	60	Co	=4	8·4
9	2730	45	Bh	2−8, 4+2	8·2
9	2730	32	Ca	3−3, 4+2	8·2
2	2733	22	Ni	4 (3) v (5) 7	8·9
3	2734	80	AB	4−3, e+4	8·7*b*
4	2735	60	Co	=4	8·4
6	2737	,,	,,	=4	8·4
7	2738	80	AB	4−5, e+3	8·9*c*
7	2738	90	Bh	=5, =6	8·8
9	2740	55	Bo	6 (1) v (3) 7	9·0
9	2740	47	Gi	4−3, 5+1·5	8·7
0	2741	22	Ni	4 (4) v (3·5) 7	9·1
0	2741	60	Co	4−3	8·7
0	2741	90	Mn	4−3, 5+1	8·7
3	2744	80	AB	4−6·5, e+2	9·0*b*
4	2745	25	,,	4−5, e+2	8·9*b*
4	2745	55	Bo	6 (1) v (3) 7	9·0
4	2745	,,	Bg	6−3, 7+5	9·1
5	2746	90	Bh	6+2	8·6
6	2747	60	Co	4−7, 7+4	9·2*b*
6	2747	22	Ni	4 (3) v (2·5) 7	9·1
8	2749	25	AB	e−1, 7+6·5	9·1
ar					
2	2751	55	Bo	6 (1) v (2) 7	9·1
2	2751	,,	Bg	6−5, 7+3	9·3
2	2751	90	Bh	7+5	9·2
2	2751	32	Ca	6−4, 7+5	9·2
2	2751	60	Co	4−7, 7+4	9·2
2	2751	90	Mn	6 (1) v (5) 7	9·0*b*
2	2751	48	Wi	4−6, 7+7	9·0
3	2752	25	AB	e−3, 7+5·5	9·3
4	2753	47	Gi	5−2, 7+5·5, 9+7	9·1
6	2755	45	Bh	7+1	9·6
7	2756	60	Co	7+3	9·4
8	2757	25	AB	7+2	9·5
10	2759	48	Wi	=7, 9+3	9·7
10	2759	60	Co	7+1	9·6
10	2759	55	Bo	6 (3) v (1) 7	9·5
10	2759	22	Ni	4 (6·5) v (1) 7	9·5
10	2759	90	Bh	=7	9·7

Feb. 13, With 25, 8·7.
Feb. 25, Red.
Mar. 7, About.

1921 Mar					
11	2760	55	Bg	6−6, 7+2	9·4*b*
11	2760	80	AB	7+2	9·5
13	2762	60	Co	=7	9·7
15	2764	55	Bo	6 (4) v (1) 7	9·5
15	2764	32	Ca	7−1, 8+4	9·7
16	2765	45	Bh	10+1, 11+3, 12+5	9·9
16	2765	25	AB	7−2	9·9
17	2766	47	Gi	7−1, 9+2	9·8
18	2767	60	Co	7+1	9·6
18	2767	32	Mn	7+1·5	9·5
18	2767	55	Bg	=7	9·7
19	2768	80	AB	7−2	9·9
20	2769	60	Co	=7	9·7*b*
21	2770	55	Bo	7 (1) v (3) 8	9·8
21	2770	90	Bh	=10, 11+1	10·0
24	2773	45	,,	9−2, 11+1, 14+3	10·2
24	2773	55	Bg	7−1, 8+2	9·8
24	2773	60	Co	8+1	9·9*b*
24	2773	48	Wi	9−4, 15+2	10·4
25	2774	94	Ni	7 (6) v (1) 12	10·3
26	2775	48	Wi	9−5, 15+1	10·5
26	2775	60	Co	=8	10·0
27	2776	,,	,,	8−1, 12+3	10·1
28	2777	32	Ca	11−1, 12+1	10·3
29	2778	60	Co	8−1, 12+3·5	10·1
29	2778	94	Ni	12 (1·5) v (3) 18	10·6
29	2778	90	Bh	=11, 14+2	10·2
30	2779	55	Bo	11 (1) v (3) 12	10·2
30	2779	48	Wi	=14, 15+1	10·5
31	2780	55	Bg	=8	10·0
31	2780	60	Co	12+1, 14+2	10·3
Apr					
1	2781	80	AB	9−2, 15+2	10·3
1	2781	45	Bh	=11	10·2
1	2781	48	Wi	=15	10·6
2	2782	117	Gi	9−2, 14+1	10·3
2	2782	55	Bo	11 (1) v (1) 12	10·3
3	2783	60	D	15+2	10·4
4	2784	32	Mn	13+0·5	10·4*b*
6	2786	80	Co	12−1, =14	10·5*c*
7	2787	48	Wi	=14, 15−1	10·6
7	2787	45	Bh	17−1	11·0*b*
7	2787	55	Bo	15 (1) v (2) 16	10·7
8	2788	,,	Bg	8−2, 12+2	10·2*b*
8	2788	80	AB	15−2	10·8
8	2788	32	Ca	15−1, 16+2	10·7
8	2788	94	Ni	12 (5) v (2) 18	10·8
10	2790	80	Co	14−1	10·6
11	2791	60	D	15−3	10·9*b*
12	2792	48	Wi	14+1	10·4
12	2792	55	Bo	15 (1) v (1) 16	10·7
12	2792	45	Bh	14−4, 16−1	10·9
18	2798	94	Ni	18 (6) v (4) 21	11·4
18	2798	55	Bo	19 (1) v (4) 21	11·3
22	2802	117	Gi	15−2, 22+4	11·2*b*
23	2803	48	Wi	14−3	10·8*b*
23	2803	90	Bh	14−4	10·9
27	2807	,,	,,	14−5	11·0
27	2807	60	D	15−5	11·1*b*
28	2808	90	Mn	19 (2) v (3) 21	11·4*b*
28	2808	80	AB	22+4	11·6

Mar. 11, AB, With 25, 9·5.
Mar. 19, With 25, 9·9.
April 1, AB, With 25, 10·3.
April 8, AB, With 25, 10·8.
April 27, D, Difficult.

(5157) S BOÖTIS—*continued.*

1921					
Apr					
28	2808	55	Bg	=21, 22+4	11·7
28	2808	,,	Bo	19 (3) v (1) 21	11·6
29	2809	90	Bh	14−4, =16	10·9
29	2809	80	Ca	16−1, 20+2	11·0
29	2809	94	Ni	18 (7) v (3) 21	11·5
May					
6	2816	117	Gi	=21, 22+3	11·7
8	2818	48	Wi	22+2	11·8*b*
8	2818	55	Bg	21−2, 22+2	11·9
9	2819	90	Bh	14−5	11·0
10	2820	55	Bo	19 (4) v (1) 21	11·6
11	2821	94	Ni	21 (5) v (1) 23	12·2
20	2830	160	Bo	22 (2) v (3) 25	12·2
21	2831	45	Bh	=22	12·0
24	2834	90	,,	22−1, 25+4	12·1
24	2834	75	Bg	22−2·5, 25+2	12·3
26	2836	94	Ni	23 (2) v (4) 27	12·5
30	2840	117	Gi	=25	12·5*b*
31	2841	60	D	<25	<12·5
June					
1	2842	94	Ni	23 (6) v (1·5) 27	12·8
1	2842	55	Bo	25 (1) v (1) 27	12·7*b*
2	2843	75	Bg	25−1, 27+3	12·6*b*
2	2843	90	Bh	22−5, =25	12·5
10	2851	,,	,,	25−1	12·6
12	2853	117	Gi	25−1·5, 27+3	12·6*b*
14	2855	160	Bo	22 (3) v (1) 25	12·4
15	2856	90	Bh	22−6, 25−2	12·7
24	2865	,,	,,	=25, =26	12·7
24	2865	117	Gi	=25	12·5
July					
2	2873	94	Ni	23 (4) v (2) 27	12·7
2	2873	75	Bg	<27	<12·9*b*
3	2874	90	Bh	25+1	12·4
5	2876	75	Bg	25−2, 27+2	12·7
5	2876	117	Gi	22−6, 25+1	12·5*b*
8	2879	94	Ni	23 (4) v (2) 27	12·7
9	2880	48	Wi	<25	<12·5
11	2882	90	Bh	22−1	12·1
13	2886	117	Gi	=22	12·0
26	2897	80	AB	22+1	11·9*b*
26	2897	90	Bh	22+4	11·6*b*
29	2900	117	Gi	15−4, 22+3	11·4*b*
Aug					
1	2903	55	Bg	=15	10·6
3	2905	80	Ca	18−3, =19	11·2
5	2907	25	AB	1−2	11·8
6	2908	90	Bh	21+2	11·5*b*
8	2910	55	Bg	=14, 15+1	10·5
8	2910	80	Co	=17	10·9
8	2910	117	Gi	=14	10·5
14	2916	90	Bh	15−2, 21+7	10·9*b*
18	2920	94	Ni	7 (2) v (6) 12	9·8
18	2920	55	Bo	7 (1) v (1) 8	9·8
19	2921	,,	Bg	=8, =9	10·0*b*
22	2924	90	Bh	7−1, 8+3	9·7*b*
22	2924	117	Gi	5−4, 7+2, 9+3	9·4
24	2926	60	D	7−3, 11+3	9·9*b*
24	2926	55	Bo	6 (2) v (1) 7	9·4
25	2927	80	Ca	6−8, 7+1	9·6
25	2927	,,	Co	=7, 8+3	9·7
26	2928	22	Ni	7 (2) v (4) 12	9·9
28	2930	80	Co	=7	9·7*b*

1921					
Aug					
29	2931	80	Co	7+2	
30	2932	,,	,,	=7	
31	2933	90	Bh	11+5, 14+8	
31	2933	55	Bo	6 (2) v (1) 7	
Sept					
1	2934	22	Ni	4 (6) v (1·5) 7	
2	2935	75	Gi	6−2, 7+6	
2	2935	80	Co	7+2	
4	2937	,,	,,	7+3	
4	2937	90	Bh	=7	
4	2937	32	Ca	6−7, 7+1	
4	2937	30	D	e−4, 7+2	
5	2938	48	Wi	7+1	
5	2938	55	Bo	6 (5) v (3) 7	
6	2939	80	Co	7+2	
7	2940	25	AB	e−4, 7+2	
8	2941	48	Wi	7+1, 14+9	
8	2941	80	Co	7+2	
10	2943	,,	,,	7+3	
12	2945	,,	,,	7+3	
14	2947	,,	,,	7+5	
14	2947	47	Gi	4−7, 7+4·5	
16	2949	80	Co	7+6	
16	2949	22	Ni	4 (5) v (3) 7	
16	2949	90	Bh	7+2, 8+6	
21	2954	55	Bo	6 (1) v (3) 7	
21	2954	48	Bg	6 3, 7	
22	2955	25	AB	e−2, 7+4	
23	2956	30	D	e−4, 7+2	
24	2957	25	AB	4−5, =e	
25	2958	22	Ni	4 (3·5) v (5) 7	
25	2958	30	D	e−2, 7+4	
26	2959	55	Bo	6 (1) v (3) 7	
27	2960	30	D	=e	
27	2960	25	AB	4−5, e+1	
28	2961	90	Bh	7+4, 9+8	
29	2962	30	D	d−2, e+2	
29	2962	48	Bg	4−3, 6+1	
30	2963	25	AB	4−4, e+2	
30	2963	47	Gi	4−3, 7+12	
Oct					
1	2964	55	Bo	4 (3) v (1) 5	
1	2964	48	Bg	4−2, 6+2	
1	2964	80	Co	4−3	
5	2968	,,	,,	=4	
5	2968	48	Wi	=4	
5	2968	90	Bh	=5, =6	
5	2968	25	AB	4−3, e+3	
6	2969	48	Bg	4−1, 6+3	
6	2969	22	Ni	4 (1) v (6) 7	
7	2970	80	Co	=4	
7	2970	55	Bo	3 (4) v (1) 4	
9	2972	80	Co	4+1	
9	2972	90	Bh	4−3	
11	2974	80	Co	4+1	
11	2974	47	Gi	3−4, 4+1	
14	2977	80	Co	3−2, 4+1	
15	2978	,,	,,	3−1, 4+2	
16	2979	55	Bo	3 (1) v (4) 4	
17	2980	90	Bh	=4	
17	2980	80	Co	3−2, 4+2·5	
18	2981	,,	,,	=4	
18	2981	22	Ni	4+1	
18	2981	48	Bg	3−4, 4+1	
18	2981	25	AB	4−5, 4+3	
20	2983	,,	,,	4−2, 4+2	

June 2, Bg, About. 27 only just visible.
July 9, Glimpsed.
Aug. 18, Ni, With 22, 9·8.

(5157) S BOÖTIS—*continued.*

1921					
Oct					
21	2984	80	Co	3−2, 4+2	8·2
23	2986	,,	,,	3−2, 4+3	8·1
23	2986	90	Bh	4+2	8·2
24	2987	80	Co	4+1	8·3
25	2988	,,	,,	4+2	8·2
27	2990	45	Bh	4+4	8·0
29	2992	80	Co	4+1	8·3
30	2993	75	Gi	3−3·5, 4+1·5	8·3
31	2994	48	Bg	=4	8·4*b*
31	2994	55	Bo	3 (2) v (3) 4	8·1
Nov					
1	2995	80	Co	=4	8·4
6	3000	90	Bh	2−5, 4+5	7·9
7	3001	25	AB	=4	8·4
7	3001	80	Co	4−1	8·5
8	3002	,,	,,	=4	8·4
8	3002	22	Ni	4 (1·5) v (6) 7	8·6
10	3004	80	Co	4−1	8·5
11	3005	45	Bh	2−5, 4+5	7·9*b*
17	3011	55	Bo	4 (3) v (1) 5	8·7
22	3016	22	Ni	4 (6) v (3) 7	9·2*b*
22	3016	25	AB	e--1	9·2
23	3017	140	Bo	6 (1) v (3) 7	9·0
23	3017	75	Bg	=6	8·8*b*
24	3018	22	Ni	4 (6) v (2) 7	9·4
24	3018	90	Bh	4−2, 7+8	8·7
25	3019	80	Co	7+4	9·3
25	3019	90	Bh	4−4	8·8
26	3020	55	Bo	6 (3) v (5) 7	9·1
28	3022	75	Gi	4−5·5, 7+3·5	9·1
Dec					
4	3028	80	Co	=7	9·7*c*
4	3028	90	Bh	4−10, 7+2	9·4
15	3039	,,	,,	=9	10·0
20	3044	80	Co	=14	10·5*c*
21	3045	48	Wi	<15	<10·6
21	3045	90	Bh	11−1, 12+1	10·3*b*
25	3049	,,	,,	=14, 15+2	10·4
25	3049	94	Ni	=18	11·0
26	3050	140	Bo	12 (1) v (1) 14	10·4*b*
26	3050	90	Bh	14−1, =15	10·6
27	3051	117	Gi	=14, 15+1	10·5*b*
28	3052	94	Ni	12 (3) v (2) 18	10·8
28	3052	75	Bg	=12, 15+3	10·3
28	3052	80	Co	14−2, =15	10·6*b*
30	3054	,,	,,	15−2	10·8*c*
30	3054	90	Bh	14−4, 15−3	10·9
1922					
Jan					
2	3057	...	Sa	7−7, =11, 15+5	10·2
3	3058	80	Co	<15	<10·6*c*
4	3059	60	D	15−4, k+1	11·0*b*
7	3062	...	Gi	15 (1) v (6) 22	10·8
10	3065	53	Wi	<15	<10·6*b*
10	3065	90	Bh	14−4, 15−2	10·8*b*
12	3067	160	Bo	19 (3) v (3) 21	11·4*c*
17	3072	55	,,	19 (4) v (2) 21	11·5
18	3073	90	Bh	15−7, 21+3	11·4

Oct. 21, 23, Co, White.
Oct. 24, 25, 29, White.
Dec. 20, About.
Dec. 21, Wi, Glimpsed.
Dec. 30, Co, About.
Jan. 3, Considered about 10·9.
Jan. 4, Difficult.
Jan. 10, Wi, Not seen.

1922					
Jan					
20	3075	90	Bh	16−4, 22+8	11·3
20	3075	55	Bg	=21	11·7*c*
21	3076	90	Bh	16−8, 22+5	11·6
22	3077	94	Ni	18 (6) v (2) 21	11·3
30	3085	55	Bo	19 (4) v (1) 21	11·6*b*
Feb					
1	3087	160	Bo	22 (1) v (4) 25	12·1
2	3088	90	Bh	22+4, 25+0	11·8
4	3090	...	Gi	21 (3) v (1·5) 22	11·9
5	3091	90	Bh	21−3	12·0
5	3091	160	Bo	22 (3) v (2) 25	12·3*b*
8	3094	275	,,	22 (2) v (3) 25	12·2
14	3100	160	,,	22 (2) v (3) 25	12·2*b*
17	3103	...	Sa	22−3	12·3
17	3103	90	Bh	25−1, 27+3	12·6
18	3104	160	Bo	22 (3) v (2) 25	12·3
18	3104	75	Bg	−22	12·0*b*
25	3111	160	Bo	22 (3) v (2) 25	12·3
25	3111	75	Bg	22−3, 25+2	12·3*b*
25	3111	...	Gi	22 (4) v (1) 25	12·4
25	3111	94	Ni	23 (3) v (1) 27	12·8
26	3112	83	Li	<25	12·5
26	3112	90	Bh	25−2, 27+2	12·7
Mar					
2	3116	275	Bo	22 (4) v (1) 25	12·4
4	3118	90	Bh	25−3	12·8
8	3122	275	Bo	25 (2) v (2) 27	12·7
15	3129	90	Bh	25−4	12·9
16	3130	275	Bo	25 (2) v (3) 27	12·7*b*
17	3131	...	Gi	25 (3·5) v (1) 27	12·8
18	3132	94	Ni	23 (5) v (1·5) 27	12·8
19	3133	90	Bh	25−4	12·9
22	3136	,,	,,	25−4	12·9
23	3137	275	Bo	25 (2) v (2) 27	12·7
28	3142	90	Bh	25−3	12·8
29	3143	94	Ni	−27	12·9
Apr					
2	3147	75	Bg	−25	12·5
4	3149	90	Bh	25−1	12·6
9	3154	,,	,,	22−4, −25	12·5*b*
13	3158	...	Gi	25 (2) v (3·5) 27	12·7
14	3159	94	Ni	23 (3) v (2) 27	12·7
16	3161	160	Bo	22 (3) v (2) 25	12·3
17	3162	90	Bh	22−5, 25+1	12·5
19	3164	75	Bg	22−3, 25+1	12·4
20	3165	94	Ni	23 (2) v (4·5) 27	12·5
20	3165	140	Bo	22 (2) v (3) 25	12·2
24	3169	33	Wi	<22	12·0
29	3174	90	Bh	−22	12·0
May					
2	3177	,,	,,	22+1, 25+5	12·0
4	3179	55	Bo	19 (4) v (3) 21	11·5
5	3180	,,	Bg	19−4, 21+1	11·6*b*
6	3181	120	Wi	15−5, 22+3	11·4
8	3183	71	,,	14−6, 15−1	10·8
8	3183	...	Gi	15 (2·5) v (5) 22, 14−2·5	10·9
8	3183	90	Bh	14−6, 15−3	10·9*b*
12	3187	44	Wi	11−1, 14−1, 15+1	10·4
13	3188	32	Ca	14−1, 15+1	10·5
14	3189	55	Bo	15 (2) v (2) 18	10·8*b*
14	3189	,,	Bg	12−2, 15+1	10·5
14	3189	80	Co	15+2	10·4*b*

Jan. 20, Bg, About.
April 24, Not seen.
April 29, Not steady.

(5157) S BOÖTIS—*continued.*

1922					
May					
15	3190	80	Co	14−2, =15	10·6
17	3192	90	Bh	14+1, 15+3	10·3
19	3194	...	Gi	=9	10·3
19	3194	...	Sa	7−4, 11+1	10·1
19	3194	120	Wi	14−2, =15	10·6
20	3195	55	Bo	10 (1) v (1) 11	10·1
21	3196	,,	Bg	11−1, =12, 15+3	10·3
21	3196	94	Ni	=12	10·4*b*
23	3198	32	Ca	=11	10·2
26	3201	55	Bg	7−2, 8+1, 9+1	10·0
27	3202	22	Ni	7 (4) v (1) 12	10·2*b*
28	3203	140	Bo	7 (1) v (4) 11	9·8
29	3204	...	Gi	=7, 9+3	9·8
30	3205	32	Ca	7−2, 8+2	9·8
31	3206	90	Bh	=7, =8, =9	10·0*b*
June					
1	3207	55	Bg	7−1, 8+3	9·7
4	3210	22	Ni	4 (6) v (1·5) 7	9·4
8	3214	32	Ca	4−10, 7+3	9·4
12	3218	55	Bg	6−3, 7+6	9·1
12	3218	45	Bh	4−1	8·5
14	3220	...	Gi	5−1	8·9
15	3221	80	Co	7+5	9·2*c*
16	3222	55	Bo	6 (3) v (6) 7	9·1*b*
17	3223	62	Wf	4−2, 5+1	8·6*b*
18	3224	150	,,	6−5	9·3*b*
20	3226	80	Co	4−3	8·7
22	3228	45	Bh	=4	8·4*b*
23	3229	55	Bg	4−1, =5	8·6*b*
23	3229	...	Sa	3−4, 4−1, d+2, e+4	8·5
25	3231	80	Co	4−1·5	8·5
26	3232	62	Wf	1−6, 2−7·5, 4+3	8·0
27	3233	...	Gi	4 (1) v (2) 6	8·5
29	3235	45	Bh	=4	8·4*b*
29	3235	80	Co	=4	8·4
29	3235	...	Sa	2−10, 3−6, 4−1, d+3, e+6	8·5
July					
1	3237	55	Bo	3 (3) v (1) 4	8·3
2	3238	45	Bh	2−4, 4+4	7·9
2	3238	32	Ca	4−1, 5+3	8·5
2	3238	150	Wf	2−3, 5+7	7·9*b*
3	3239	55	Bg	4+2	8·2
8	3244	...	Gi	4−1	8·5
9	3245	32	Ca	=4	8·4*b*
11	3247	80	Co	=4	8·4
11	3247	...	Sa	2−8, 3−2, 4+1, e+8	9·2
12	3248	22	Ni	=4	8·4
14	3250	45	Bh	2−2, 4+6	7·7
18	3254	80	Co	=4	8·4
19	3255	55	Bo	3 (2) v (2) 4	8·2*b*
19	3255	30	Bg	3−2, 4+2	8·2
19	3255	32	Ca	3−4, 4+1	8·3*b*
20	3256	80	Co	=4	8·4
23	3259	...	Gi	=4	8·4
23	3259	F	Wf	2−5, 3−1	8·0
24	3260	30	Bg	3−3, 4+2	8·2
27	3263	45	Bh	=2, 5+10	7·6
30	3266	62	Wf	2−6, 4+7	7·8*b*
30	3266	80	Co	4+0·5	8·3
31	3267	,,	,,	=4	8·4
31	3267	55	Bo	2 (2) v (3) 3	7·6*b*
31	3267	30	Bg	3−3, 4+2	8·2

* June 26, Orange red.

1922					
Aug					
5	3272	90	Bh	4+3	8
7	3274	30	Bg	3−3, 4+2	8
7	3274	80	Co	4+1	8
7	3274	22	Ni	4 (0·5) v (6) 7	8
9	3276	...	Gi	4−1·5	8
10	3277	32	Ca	3 (3) v (2) 4	8
14	3281	62	Wf	2−7, 4+1	8
15	3282	30	D	=4	8
15	3282	80	Co	4−1	8
16	3283	55	Bo	3 (4) v (1) 4	8
16	3283	,,	Bg	3−3, 4+2	8
17	3284	80	Co	4−1·5	8
17	3284	22	Ni	4 (1) v (6) 7	8
18	3285	45	Bh	=4	8
19	3286	30	Co	4−1·5	8
20	3287	55	Bo	4 (1) v (3) 5	8
20	3287	,,	Bg	3−4, 4+1	8
20	3287	22	Ni	4 (3·5) v (3·5) 7	9
21	3288	62	Wf	=4, 5+4	8
23	3290	...	Sa	3−15, 4−7, =e, 7+7	9
23	3290	30	Co	4−2·5	8
23	3290	90	Bh	=4	8
25	3292	,,	,,	=4	8
25	3292	32	Ca	4 (5) v (8) 7	8
26	3293	55	Bg	4−3, 5+1	8
26	3293	...	Gi	4 (4·5) v (12) 7	8
27	3294	22	Ni	4 (5) v (3) 7	9
27	3294	30	Co	4−4	8
30	3297	32	Ca	6 (1) v (2) e	8
31	3298	30	Co	4 (3) v (2) 7	9
31	3298	90	Bh	4−3	8
Sept					
4	3302	45	,,	4−6, 7+7	9
7	3305	150	Wf	5−5, 7+6	9
8	3306	32	Ca	4 (9) v (3) 7	9
10	3308	45	Bh	4−10, 7+1	9
10	3308	22	Ni	4 (7·5) v (1·5) 7	9
11	3309	...	Sa	3−15, 4−10, d−8, 7+4, 11+8	9
11	3309	30	Co	7+2	9
13	3311	,,	,,	=7, 8+4	9
13	3311	62	Wf	5−6, 7+2, 11+5	9
13	3311	32	Ca	7 (1) v (2) 8	9
15	3313	90	Bh	7+1	9
15	3313	30	Co	=7	9
16	3314	100	Wf	5−6, 12+6	9
17	3315	...	Gi	7+3	9
17	3315	30	Co	7−0·5	9
18	3316	94	Ni	7 (4) v (2) 12	10
20	3318	30	Co	7−1	9
20	3318	48	Bg	7−1, 8+2	9
21	3319	90	Bh	=7, =8	9
23	3321	62	Wf	7+1	9
24	3322	30	Co	7−3·5, 11+3	10
26	3324	90	Bh	=9	10
Oct					
4	3332	...	Sa	7−8, 11−4, 15+4	10
5	3333	90	Bh	=14, =15	10
7	3335	94	Ni	12 (1) v (3) 18	10
8	3336	62	Wf	14−1, =15	10
8	3336	80	Ca	15 (2) v (1) 16	10
12	3340	48	Bg	17−2, =19	11
12	3340	90	Bh	14−5, 15−3	10

Aug. 15, D, 3-in.
Sept. 18, With 22, 10·2.

(5157) S BOÖTIS—*continued.*

1922 Oct					
13	3341	30	Co	15−4	11·0*c*
13	3341	55	Bo	19 (1) v (3) 21	11·3*b*
13	3341	94	Ni	18 (1·5) v (6) 21	11·1
14	3342	90	Bh	15−5, 22+8	11·2
15	3343	62	Wf	19−2, 21+3	11·4
16	3344	94	Li	=21	11·7
18	3346	,,	,,	=21	11·7
20	3348	90	Bh	15−6, 21+3	11·3
21	3349	94	Ni	18 (5) v (3) 21	11·4
22	3350	62	D	15−4	11·0*b*
25	3353	90	Bh	15−10, 21+1, 22+4	11·6
28	3356	140	Bo	21 (2) v (3) 22	11·8
Nov					
1	3360	...	Gi	15 (13) v (2) 22	11·8
1	3360	90	Bh	22+2	11·8*b*
4	3363	,,	,,	=22	12·0
9	3368	94	Ni	21 (2) v (2) 23	12·0
9	3368	90	Bh	=22	12·0
10	3369	150	Wf	22−1, 25+3	12·2
14	3373	90	Bh	22−4, =25	12·5
15	3374	94	Ni	23 (1) v (4) 27	12·4
18	3377	90	Bh	=25	12·5*b*
20	3379	...	Gi	22 (4) v (2) 25	12·3
24	3383	90	Bh	24−3, 27+2	12·8
Dec					
6	3395	,,	,,	24−5, =27	13·0*b*
11	3400	,,	,,	<27	<12·9
16	3405	,,	,,	<25	<12·5
19	3408	94	Ni	=27	12·9
23	3412	75	Bg	<22	<12·0*b*
23	3412	90	Bh	Estimated	<12·5
26	3415	120	Wi	<22	<12·0
30	3419	94	Ni	27+1	12·8
1923 Jan					
4	3424	90	Bh	<27	<12·9
6	3426	150	,,	24−4, 27+1	12·9
9	3429	94	Ni	27 (4) v (2) 31	13·3
11	3431	90	Bh	25−2	12·7
16	3436	94	Ni	=27	12·9
17	3437	117	Gi	25−2·5	12·8
23	3443	157	Wf	22−3, 25+1	12·4
25	3445	75	Bg	22−1	12·1*b*
27	3447	90	Bh	22−2, 25+3	12·2
Feb					
4	3455	,,	,,	=22	12·0
6	3457	...	Sa	22+2	11·8
6	3457	94	Ni	21+1	11·6
7	3458	62	Wf	=21, 22+2	11·8
8	3459	90	Bh	22+1	11·9
13	3464	94	Ni	18 (6) v (3) 21	11·5
14	3465	32	Ca	20 (2) v (3) 21	11·4
16	3467	90	Bh	14−10, 22+5	11·5
18	3469	55	Bg	15−7, 21+4	11·3*b*
21	3472	80	Co	15−2, =17	10·8*b*
23	3474	45	Bh	=14, 15−2	10·6
23	3474	55	Bg	14−1, 15+0·5	10·6*b*
Mar					
1	3480	94	Ni	=12	10·4*b*
1923 Mar					
2	3481	90	Bh	=14	10·5
5	3484	,,	,,	=9, 14+4	10·0
5	3484	55	Bg	7−2, 8+1	9·9
5	3484	30	Co	7−3, =8	10·0*b*
7	3486	32	Ca	7 (2) v (1) 9	9·9
13	3492	90	Bh	9+3, 11+3, 14+5	9·9
16	3495	22	Ni	7 (1) v (4) 12	9·8
16	3495	117	Gi	6 (2·5) v (3·5) 9	9·3
16	3495	30	Co	4 (3) v (1) 7	9·4*b*
17	3496	32	Ca	4 (7) v (6) 7	9·1
17	3496	55	Bg	6−4, 7+5	9·2
17	3496	90	Bh	9+5, 11+6, 12+6	9·6*b*
18	3497	34	Li	6 (3) v (7) 7	9·1
21	3500	90	Bh	7+4, 12+10	9·3*b*
21	3500	22	Ni	4 (4·5) v (2·5) 7	9·2
24	3503	30	Co	4 (1) v (1) 7	9·0*b*
24	3503	75	Bg	6−2, 7+7	9·0
25	3504	90	Bh	4−4	8·8
26	3505	34	Li	4 (1) v (9) 7	8·5
26	3505	30	Co	4 (1) v (1) 7	9·0*b*
28	3507	117	Gi	6 (2) v (9) 7	9·0
Apr					
1	3511	90	Bh	4−2	8·6
2	3512	22	Ni	4 (2·5) v (4) 7	8·9
3	3513	30	Co	4−0·5	8·4*b*
4	3514	50	Bn	4 (1) v (2) d	8·5
4	3514	32	Ca	4 (8) v (5) 7	9·2
6	3516	F	Wf	4−2, d+2	8·6*b*
8	3518	22	Ni	4 (4) v (4) 7	9·0
8	3518	31	D	4−1, d+3	8·5
8	3518	90	Bh	4+1	8·3*b*
8	3518	55	Bg	4−2, 6+2	8·6
10	3520	62	Wf	4+1	8·3
12	3522	32	Ca	3 (2) v (3) 4	8·1
13	3523	34	Li	=4	8·4
13	3523	90	Bh	4+2	8·2
14	3524	55	Bg	4−1, 6+3	8·5
14	3524	...	Sa	4−5, 5+1	8·8
14	3524	30	Co	=4	8·4*b*
14	3524	,,	D	4+1	8·3
14	3524	44	Wi	4+2	8·2
15	3525	F	Wf	3−4, =4	8·4
17	3527	90	Bh	4+2	8·2
19	3529	55	Bg	4 (1) v (3) 6	8·5*b*
21	3531	32	Ca	3 (1) v (3) 4	8·0
22	3532	22	Ni	4+2	8·2
22	3532	90	Bh	4+1	8·3
24	3534	30	D	=4	8·4
26	3536	,,	Co	3−1·5, 4+3·5	8·1
28	3538	...	Sa	4−5, =5	8·8*b*
May					
1	3541	90	Bh	=4	8·4
2	3542	47	Gi	4 (1) v (2) 6	8·5
2	3542	32	Ca	3 (4) v (1) 4	8·3
3	3543	55	Bg	4 (1) v (3) 6	8·5
3	3543	90	Bh	4+1	8·3
3	3543	30	Co	=4	8·4*b*
3	3543	...	Sa	4−3, =5, =6	8·8
4	3544	34	Li	3 (6) v (4) 4	8·2*b*
4	3544	44	Wi	4−4	8·8
5	3545	,,	,,	4−6	9·0
5	3545	22	Ni	4 (1) v (6) 7	8·6
5	3545	30	D	4−1, d+4	8·4
6	3546	F	Wf	=4	8·4
8	3548	90	Bh	=4	8·4*b*
8	3548	32	Ca	=4	8·4
11	3551	55	Bg	4 (3) v (1) 6	8·7
12	3552	...	Sa	4−6, 5+2, 7+10	8·7

Oct. 13, Co, Difficult.
Dec. 11, 16, Not seen.
Dec. 23, Bg, Difficult.
Dec. 26, Invisible.
Jan. 4, Not seen.
Jan. 25, About.

(5157) S BOÖTIS—*continued.*

1923 May						1923 Sept					
13	3553	30	D	4−3, d+0·5	8·7	2	3665	90	Bh	22−6, 25−2	12
16	3556	34	Li	4 (5) v (5) 5	8·6	5	3668	120	Bn	27−1	13
17	3557	90	Bh	4−3, 7+10	8·7	5	3668	...	Sa	27−1	13
18	3558	22	Ni	4 (5) v (3·5) 7	9·1	6	3669	94	Ni	27 (3) v (2) 31	13
20	3560	62	Wf	=5	8·8*b*	6	3669	157	Wf	26−5, 31+2, q+3	13
23	3563	34	Li	=5	8·8	7	3670	90	Bh	25−1	12
23	3563	...	Sa	4−8, =5, =6, 7+6, 10+8	9·0	10	3673	,,	,,	22−8, 25−4	12
						11	3674	120	Bn	=27	12
24	3564	30	D	d−2, e+1	9·0	12	3675	94	Ni	27 (3) v (3) 31	13
30	3570	90	Bh	9+6, 11+7, 14+8	9·5	13	3676	150	Wf	26−3, 29+1	13
June						13	3676	90	Bh	25−4	12
2	3573	,,	,,	10+4, 11+5	9·6	16	3679	,,	,,	25−5	13
3	3574	62	Wf	7+1, 11+7	9·5	16	3679	120	Bn	27−1	13
4	3575	30	D	e−3, 7+3	9·4*b*	22	3685	90	Bh	25−5, 27−2	13
8	3579	32	Ca	7 (2) v (2) 8	9·8	30	3693	150	Wf	=29, q+4	13
8	3579	75	Gi	5 (2) v (2) 7	9·2	30	3693	...	Sa	25−2	12
10	3581	30	D	=7	9·7	Oct					
10	3581	34	Li	6 (5) v (5) 7	9·2	1	3694	90	Bh	25−5, 27−2	13
11	3582	...	Sa	5−10, 7−1, 11+5	9·7	4	3697	120	Bn	25−3	12
11	3582	45	Bh	=9, 14+4	10·0	5	3698	90	Bh	25−4	12
18	3589	30	D	7−3, 11+2, 14+3	10·0	8	3701	150	Wf	25−3, =26	12
21	3592	90	Bh	=11, =12	10·3	11	3704	...	Sa	27−3	13
23	3594	,,	,,	=11, =12	10·3	14	3707	120	Bn	=25	12
30	3601	...	Sa	14−2, 15+1	10·6	15	3708	94	Ni	23 (4) v (3) 27	12
July						17	3710	90	Bh	25−2	12
1	3602	62	Wf	14−1, =15	10·6	19	3712	,,	,,	22−5, 25+1	12
4	3605	75	Gi	11 (2·5) v (1) 15	10·5	25	3718	,,	,,	=25	12
5	3606	94	Ni	18 (4) v (5) 21	11·3	28	3721	150	Wf	=21, 22+2	11
5	3606	90	Bh	=14	10·5	Nov					
5	3606	75	Bg	15 (3) v (1) 18	10·9	4	3728	94	Ni	21 (1) v (4) 23	11
6	3607	60	D	15−3, k+2	10·9	4	3728	60	D	22+2	11
8	3609	32	Ca	=18	11·0	4	3728	50	Bn	20 (2) v (1) 21	11
8	3609	...	Sa	15−4, 16−2, 22+12	11·0	7	3731	...	Sa	15−8, 22+5	11
						7	3731	90	Bh	22−1, 25+4	12
10	3611	62	Wf	16−2, 18−1, 21+6	11·1	9	3733	,,	,,	22+3	11
10	3611	94	Ni	18 (4) v (5) 21	11·3	10	3734	94	Ni	18 (5) v (4) 21	11
13	3614	60	D	=1	11·6*b*	11	3735	30	Co	17−3	11
14	3615	75	Bg	18 (1) v (2) 21	11·2	16	3740	90	Bh	14−5, 15−3	10
15	3616	62	Wf	19 −2, 21+4	11·3	17	3741	50	Bn	15 (1) v (1) 16	10
17	3618	94	Li	15 (7) v (3) 22	11·6	17	3741	65	Bg	14 (1) v (1) 15	10
19	3620	...	Sa	22+1	11·9	19	3743	90	Bh	=15	10
20	3621	60	D	15 (3) v (1) 22, 22+5	11·6	19	3743	...	Sa	14−3, 15+1	10
20	3621	94	Li	=21	11·7	Dec					
22	3623	150	Wf	=25	12·5	3	3757	...	,,	7−4, =11, 14+2	10
25	3626	...	Sa	22−1, 25+3	12·2	3	3757	120	Bn	9 (2) v (1) 11	10
Aug						4	3758	90	Bh	=9, 14+5	10
1	3633	94	Ni	21 (3) v (2) 23	12·0*b*	8	3762	45	,,	4−14, 9+2, 15+8	9
3	3635	90	Bh	22+3, 25+8, 27+12	11·7	9	3763	22	Ni	7 (3) v (1) 12	10
3	3635	75	Bg	=22	12·0	9	3763	30	Co	7−2	9
6	3638	150	Wf	22−5, =25	12·5	13	3767	62	Wf	=7, 9+3	9
9	3641	90	Bh	22−3, 27+6	12·3	13	3767	...	Sa	=7	9
9	3641	...	Sa	25−1, 27+3	12·6	15	3769	32	Ca	7+1	9
11	3643	75	Bg	22 (3) v (1) 25	12·4	16	3770	55	Bg	=7	9
12	3644	150	Wf	25−2, =26	12·8	19	3773	90	Bh	=7	9
15	3647	...	Sa	25−2, 26+1	12·7	24	3778	,,	,,	4−10, 7+3	9
15	3647	120	Bn	25 (2) v (3) 27	12·7	24	3778	...	Sa	5−2, 7+10	8
15	3647	90	Bh	=25	12·5	28	3782	...	,,	4−8, =5, 7+5	9
23	3655	,,	,,	25−1	12·6	1924					
26	3658	,,	,,	25−1	12·6	Jan					
28	3660	...	Sa	<25	<12·5	3	3788	75	Bg	6 (2) v (7) 7	9
29	3661	150	Wf	26 (1) v (1) 29	13·0	3	3788	34	Sa	4−7, =5, =6, 7+10	8
30	3662	...	Sa	=27	12·9	3	3788	22	Ni	7 (3) v (4) 12	10
Sept											
2	3665	94	Ni	27 (3) v (4) 31	13·2*b*						

July 13, About.
Aug. 28, Not visible.

Sept. 30, Sa, >27. 27 not visible.
Nov. 4, D, About. Difficult.
Dec. 16, About.

(5157) S BOÖTIS—*continued.*

1924 Jan					
3	3788	90	Bh	4−3	8·7
4	3789	30	Co	4−4	8·8*b*
5	3790	,,	D	4−1, d+4	8·4
6	3791	,,	Co	=4	8·4
6	3791	55	Bg	4 (3) v (1) 6	8·7
6	3791	90	Bh	4+1	8·3
11	3796	,,	,,	4+3	8·1
12	3797	22	Ni	4 (1·5) v (5) 7	8·7
14	3799	30	Co	3−3, 4+2	8·2
16	3801	90	Bh	4+5	7·9
23	3808	,,	,,	4+4	8·0
23	3808	22	Ni	4+1	8·3
25	3810	30	Co	3−2, 4+3·5	8·1
26	3811	90	Bh	1 (2) v (1) 4	8·0
26	3811	50	Bn	3 (3) v (1) 4	8·3
27	3812	30	Bg	3 (1) v (2) 4	8·1
27	3812	34	Sa	=4	8·4
27	3812	30	Co	3−3, 4+1	8·3
31	3816	90	Bh	4+5	7·9
Feb					
1	3817	22	Ni	=4	8·4
1	3817	30	D	3−4, 4+1	8·3
1	3817	,,	Co	3−2, 4+2	8·2
1	3817	50	Bn	3 (4) v (1) 4	8·3
5	3821	32	Ca	3 (3) v (2) 4	8·2
8	3824	30	D	=4	8·4
8	3824	62	Wf	2−6·5, 4+3	8.1
14	3830	22	Ni	4 (4) v (3) 7	9·1
14	3830	30	D	=4	8·4
14	3830	90	Bh	4+1	8·3*b*
15	3831	32	Ca	=4	8·4
16	3832	30	Co	4−3	8·7*b*
16	3832	34	Sa	4−3, =6	8·8
16	3832	50	Bn	3−4, 4+1	8·3
18	3834	90	Bh	=4	8·4
21	3837	,,	,,	4−1	8·5
24	3840	,,	,,	4−4, =5, =6	8·8
25	3841	32	Ca	4 (2) v (2) d	8·6
26	3842	25	Bn	d (1) v (2) 7	9·1*b*
28	3844	30	D	e−3, 7+3	9·4
28	3844	,,	Co	4 (2) v (1) 7	9·2*b*
29	3845	22	Ni	4 (7) v (1·5) 7	9·4
Mar					
1	3846	45	Bh	4−4	8·8
2	3847	64	Sa	4−8, =5, 7+4	9·1
2	3847	55	Bg	6 (3) v (1) 7	9·5*b*
3	3848	32	Ca	e (4) v (1) 7	9·6
4	3849	22	Ni	4 (7) v (1) 7	9·5
4	3849	30	D	e−3, 7+3	9·4*b*
4	3849	,,	Co	7+5	9·2*b*
4	3849	50	Bn	7+2	9·5
4	3849	90	Bh	=5, =6	8·8
7	3852	,,	,,	5−3	9·1
8	3853	55	Bg	6 (4) v (1) 7	9·5
8	3853	30	D	e−4, 7+2	9·5
9	3854	32	Ca	e (6) v (3) 8	9·7
9	3854	44	Wi	7+4	9·3
10	3855	34	Sa	6−3, 7+5	9·1
11	3856	33	Wi	7+5	9·2
11	3856	30	D	=7	9·7
11	3856	50	Bn	7+0·5	9·6
12	3857	22	Ni	7 (2) v (3) 12	10·0
12	3857	55	Bg	=7	9·7
22	3867	90	Bh	14+2	10·3

Feb. 8, D, 4[c].
Mar. 12, Ni, With 22, 10·1.

1924 Mar					
24	3869	55	Bg	=11	10·2
24	3869	44	Wi	11−2, 15+2	10·4
26	3871	32	Ca	15 (2) v (1) 17	10·8
26	3871	90	Bh	=14	10·5
27	3872	,,	Sa	=12, 14−1, 15+2	10·5
29	3874	94	Ni	18 (1) v (7) 21	11·1
29	3874	90	Bh	15−1, =17	10·8
30	3875	55	Bg	=8	10·0
30	3875	50	Bn	14 (2) v (1) 15	10·6
30	3875	60	D	15−2, k+2	10·9
30	3875	71	Wi	14+2	10·3
31	3876	44	,,	9−7, 14−1	10·6
Apr					
1	3877	,,	,,	14−3, 17+2	10·7
2	3878	90	Bh	15−3, 17−1	10·9
4	3880	32	Ca	17−1, =18	11·0
6	3882	60	D	k−2, l+3	11·3*b*
6	3882	90	Bh	15−6	11·2
6	3882	75	Bg	14 (2) v (1) 15	10·6*b*
7	3883	50	Bn	20 (5) v (2) 21	11·5
7	3883	60	Kw	14 (2) v (1) 22, 22+4	11·6
7	3883	120	Wi	14−9, 22+6	11·4
8	3884	,,	,,	22+5	11·5
9	3885	32	Ca	19 (2) v (2) 21	11·4
11	3887	60	D	k−4, l+1	11·5
11	3887	90	Bh	=22	12·0
12	3888	64	Sa	21−2, 22+2	11·9
21	3897	94	Ni	=21	11·7
24	3900	62	Wf	=22, 25+3	12·1
25	3901	75	Bg	=22	12·0*b*
25	3901	90	Bh	22−2, 25+3	12·2
26	3902	134	Sa	=27	12·9
27	3903	60	Kw	22 (1) v (1) 25, 26+4	12·3
27	3903	120	Wi	22−3, 25+2	12·3
May					
1	3907	60	Kw	25−1, 26+3	12·6
5	3911	94	Ni	=27	12·9*b*
5	3911	90	Bh	25−2	12·7
5	3911	62	Wf	22−5, =25	12·5
5	3911	75	Bg	=25	12·5
7	3913	134	Sa	25−4, 27+1	12·9
11	3917	150	Wf	25−3, 26+1	12·8
13	3919	90	Bh	25−3, 27+1	12·8
16	3922	,,	,,	25−5	13·0
23	3929	150	Wf	p−4, q+0·5	13·6
24	3930	94	Ni	27 (3) v (3) 31	13·2
24	3930	120	D	<27	<12·9
27	3933	90	Bh	25−5	13·0
June					
2	3939	157	Wf	p−4·5, q−1	13·7
4	3941	90	Bh	22−7, 27−2	12·9
8	3945	94	Ni	31−2	13·8*b*
13	3950	150	Bh	22−10, 27−7	13·3
18	3955	90	,,	<27	<12·9
22	3959	120	D	<25	<12·5
22	3959	157	Wf	q−1, r+2	13·7
24	3961	,,	,,	q−3, =r	13·9
24	3961	90	Bh	<25	<12·5
26	3963	157	Wf	q−1, r+2	13·7

April 7, Kw, T.
April 27, May 1, Kw, T.
May 5, Ni, Difficult.
June 8, Difficult. Unsteady.
June 18, Not seen.
June 22, D, Variable suspected.
June 24, 30, Bh, Not seen.

(5157) S BOÖTIS—*continued.*

1924					
June					
30	3967	150	Wf	q−1, r+3	13·7
30	3967	90	Bh	<27	<12·9
July					
2	3969	,,	,,	25−6, 27−3	13·2
2	3969	94	Ni	31−2	13·8*b*
6	3973	150	Wf	p−3, =q	13·6*b*
9	3976	90	Bh	27−1	13·0
9	3976	94	Ni	27 (4) v (1) 31	13·4
10	3977	157	Wf	28−2, q+2	13·3
14	3981	90	Bh	=27	12·9
22	3989	150	Wf	25−3, =26	12·8
24	3991	90	Bh	25−2, 27+2	12·7
26	3993	94	Ni	=27	12·9
29	3996	90	Bh	=25	12·5
30	3997	150	Wf	22−4, =25	12·5
31	3998	94	Ni	23 (2) v (3) 27	12·5
Aug					
2	4000	90	Bh	25+1, 27+5	12·4
5	4003	62	Wf	22−3, =23	12·3
7	4005	90	Bh	22−3, 25+2	12·3
9	4007	60	D	22−2, 25+3	12·2
15	4013	134	Sa	=21, 22+3	11·7
15	4013	90	Bh	22+1	11·9
17	4015	60	D	=21, 22+5	11·6*b*
18	4016	32	Ca	=21	11·7
19	4017	90	Bh	14 (2) v (1) 22	11·5
23	4021	62	Wf	19−5, 21+1	11·6
27	4025	,,	,,	18−2, 21+5	11·2
30	4028	32	Ca	19 (3) v (1) 21	11·6
Sept					
2	4031	90	Bh	15 (2) v (3) 21	11·0
3	4032	62	Wf	18−3, 21+5	11·3
3	4032	64	Sa	15−3, =17	10·9
8	4037	90	,,	15−1, 16+2	10·7
9	4038	,,	Bh	15−5	11·1*b*
10	4039	62	Wf	14−5, 15−3	10·9
12	4041	94	Ni	18 (3) v (4) 21	11·3
14	4043	90	Bh	15 (1) v (4) 22	10·9*b*
16	4045	,,	,,	14−2, 15−1	10·7
17	4046	64	Sa	14−2, 15+1	10·6
18	4047	32	Ca	14−2, =15	10·6
23	4052	90	Bh	11 (2) v (1) 14, =12	10·4
26	4055	62	Wf	9−5, 15+3	10·4
27	4056	64	Sa	11−2, 12+2, =14, 15+6	10·3
28	4057	32	Ca	=14	10·5
29	4058	45	Bh	=9	10·0*b*

July 2, Ni, Difficult. Unsteady.
July 9, Ni, Difficult.
July 14, Not seen.
Aug. 17, About.

1924					
Oct					
2	4061	45	Bh	7 (2) v (1) 18, =9	9
5	4064	62	Wf	4−7, 7+5, 9+7	9
6	4065	34	Sa	=5, =6, 7+4	9
6	4065	45	Bh	=7	9
7	4066	32	Ca	4 (7) v (6) 7	9
13	4072	,,	,,	4−3	8
13	4072	150	Bh	=5, =6	8
15	4074	45	,,	4 (1) v (4) 9	8
16	4075	62	Wf	4−1, A−7	8
20	4079	32	Ca	4−1	8
22	4081	34	Sa	4−6, 7+10	8
23	4082	22	Ni	4 (2·5) v (4) 7	8
23	4082	50	Bn	4 (1) v (4) e	8
23	4082	34	Li	3 (8) v (2) 4	8
24	4083	90	Bh	4−1	8
28	4087	32	Ca	4−2	8
30	4089	45	Bh	=4	8
Nov					
3	4093	90	Sa	4−4, 5+2	8
4	4094	50	Bn	4 (1) v (2) e	8
4	4094	34	Li	4 (2) v (8) 7	8
4	4094	22	Ni	4 (4) v (5) 7	9
5	4095	90	Bh	=4	8
10	4100	45	,,	4+1	8
15	4105	90	,,	4−4	8
15	4105	22	Ni	4 (5) v (4) 7	9
17	4107	55	Bg	6 (1) v (6) 7	8
22	4112	32	Ca	4−4	8
24	4114	90	Bh	4 (2) v (1) 7	9
27	4117	22	Ni	4 (7) v (1) 7	9
27	4117	50	Bn	e (4) v (1) 7	9
Dec					
1	4121	90	Bh	=7, 12+4	9
4	4124	,,	,,	11+1, 12+4	10
5	4125	32	Ca	e (4) v (2) 7	9
8	4128	60	D	7−3, 11+2	10
9	4129	44	Li	=9	10
12	4132	90	Bh	=12	10
15	4135	45	,,	11−5, 12−1	10
19	4139	90	,,	14 (1) v (1) 15	10
22	4142	60	D	14−2, 15+1	10
22	4142	94	Ni	18 (2) v (6) 21	11
23	4143	32	Ca	17 (1) v (1) 19	11
24	4144	90	Bh	14−2, =15	10
26	4146	75	Bg	=14, 15−1	10
27	4147	90	Sa	=12	10
28	4148	,,	Bh	14 (1) v (3) 22	10
30	4150	94	Ni	18 (4·5) v (3) 21	11

Oct. 23, Ni, Unsteady.

(5338) U BOÖTIS. (V. 4.)

H.D. 144918.

Date.	Julian Date.	Inst.	Observer.	Comparisons.	Deduced Mag.
1918					
May					
4	1718	90	Bh	5−5, =9	10·9
6	1720	,,	,,	5−5, 9+3	10·7
16	1730	,,	,,	5−6, 9+2	10·8
19	1733	,,	,,	5−5, 7−3, 9+1	10·8
19	1733	160	Br	=7	10·5
26	1740	90	Bh	4−4, =7, 9+5	10·5
31	1745	,,	,,	6−2, =7, 9+2	10·6
June					
4	1749	160	Br	7−3, 9+2	10·8
13	1758	45	Bh	6−6, 7−3, 9−1	11·0
29	1774	,,	,,	7−2, 9−4	11·1
July					
3	1778	90	Bh	9−10, 13+1	11·9*b*
3	1778	160	Br	9−5, =13	11·7*b*
13	1788	90	Bh	9−8, 13+2	11·8
18	1793	45	,,	9−5, 13+5, 14+3	11·6*b*
18	1793	120	Br	13−1	12·1
25	1800	150	Bh	12+1, 13+2	11·8*b*
29	1804	120	Br	9−5, 13+5	11·5*b*
Aug					
9	1815	90	Bh	10−4, 13+4	11·6
12	1818	160	Br	=9	11·0
16	1822	90	Bh	7−3, 9+1, 13+10	10·9
21	1827	45	,,	4−10, =9, 13+10	11·0*b*
30	1836	,,	,,	7−1, 9+1	10·8
Sept					
2	1839	,,	,,	4−5, 5−3, =6, 7+1	10·4
7	1844	,,	,,	4−2, 6+2, 7+2	10·2
10	1847	90	,,	4−2, 5+2, 7+3	10·1
17	1854	,,	,,	=5, 7+1	10·3
22	1859	,,	,,	=5, =6	10·3
25	1862	,,	,,	5−1, 7+1	10·4
26	1863	120	Br	7−3, 9+1	10·9
30	1867	90	Bh	=4, =5, 7+5	10·1
Oct					
4	1871	45	,,	=4, 6+4, 9+10	10·0
13	1880	90	,,	4−2, 5+3	10·0
15	1882	,,	,,	4+2, 5+4, 9+10	9·9
31	1898	,,	,,	=4, =5	10·1*b*
Nov					
5	1903	,,	,,	5−2, =6, 7+1	10·4
8	1906	45	,,	=7, =6	10·5
10	1908	,,	,,	4−1, =5, 7+2	10·2
13	1911	,,	,,	4−3, 5−1, 6+1	10·3
21	1919	,,	,,	4−1, =6, 7+3	10·2
Dec					
3	1931	90	,,	7−2, 9+2	10·8*b*
6	1934	,,	,,	5−3, 6−3, =7	10·6
13	1941	45	,,	5−4, =7, 9+3	10·6
16	1944	,,	,,	7−3, 9+1	10·9
22	1950	90	,,	9−5, 13+5	11·5
25	1953	45	,,	9−6, 13+4	11·6
29	1957	90	,,	9−7, 13+3	11·7

July 3, Br, Difficult.

Date.	Julian Date.	Inst.	Observer.	Comparisons.	Deduced Mag.
1919					
Jan					
7	1966	90	Bh	9−6, 13+3	11·6
9	1968	60	D	9−4	11·4*b*
15	1974	90	Bh	9−5, 13+5	11·5*b*
22	1981	,,	,,	9−3, 13+6	11·3
26	1985	,,	,,	6−5, 7−3, 9+1	10·9
Feb					
7	1997	,,	,,	5−3, =7	10·5
9	1999	45	,,	=5, 7+2	10·3
12	2002	90	,,	5−1, =6, 7+2, 9+6	10·4
18	2008	,,	,,	4−3, 5−1, 6+1, 7+2	10·3*b*
23	2013	,,	,,	5−1, =6, 7+2	10·3
24	2014	,,	,,	6−1, 7+1	10·5
28	2018	,,	,,	5−3, 7−1, 9+3	10·6
Mar					
2	2020	60	D	9−1, 10+1	11·1
3	2021	90	Bh	7−2, 9+2	10·8*b*
5	2023	,,	,,	7−2, 9+2	10·8
9	2027	,,	,,	6−6, 7−4, =9	11·0
12	2030	,,	,,	9−2	11·2
15	2033	,,	,,	7−6, 9−3, 13+8	11·2
16	2034	,,	,,	7−7, 9−3	11·3
21	2039	,,	,,	9−4, 13+6	11·4
28	2046	,,	,,	6−10, 9−7, 12+3, 13+3	11·6
31	2049	,,	,,	=12, 13+1, 14+1	11·9
Apr					
4	2053	,,	,,	9−6, 13+3	11·6
8	2057	,,	,,	9−3, 13+7	11·3
12	2061	,,	,,	9−1, 10+1	11·1
18	2067	,,	,,	9+2	10·8*b*
20	2069	,,	,,	6−3, 9+3	10·7
22	2071	,,	,,	6−3, 9+3	10·7
24	2073	,,	,,	6−1, 9+2	10·6
24	2073	75	Bn	7 (3) v (1) 9	10·9
26	2075	90	Bh	6−4, =7, 9+2	10·7*b*
May					
2	2081	,,	,,	5−3, 6−1, 9+4	10·5
4	2083	,,	,,	6−1, 9+3	10·6
4	2083	50	Bu	7 (3) v (1) 9	10·9
5	2084	30	D	7−3, 9+2	10·8*b*
9	2088	90	Bh	5−1, =6, 9+6	10·4*b*
11	2090	,,	,,	=5, 6+1	10·3
18	2097	60	D	7−2, 9+3	10·7
19	2098	90	Bh	7−2, 9+1	10·8
19	2098	95	Bn	9+1	10·9
22	2101	120	,,	7 (3) v (1) 9	10·9
22	2101	60	D	7−1, 9+4	10·6
26	2105	90	Bh	7+5, =9	10·5
28	2107	30	D	7−2, 9+3	10·7
28	2107	120	Bn	7 (3) v (1) 9	10·9
30	2109	45	Bh	6−5, 7−4, 9+1	10·9
June					
2	2112	,,	,,	5−3, =7, 9+4	10·6
7	2117	,,	,,	6−6, 7−3, =9	10·9*c*

Jan. 9, Difficult.

(5338) U BOÖTIS—*continued.*

1919					
June					
7	2117	120	Bn	9−0·5	11·0
7	2117	60	D	7−3·5, 9+1·5	10·9
13	2123	90	Bh	7−6, 9−2	11·2*c*
16	2126	60	D	9−2	11·2*b*
16	2126	120	Bn	=9	11·0
21	2131	,,	,,	9 (1) v (2) 10	11·1
21	2131	90	Bh	5−10, 7−5, 9−2	11·2*b*
28	2138	45	,,	7−2, 9+1	10·8*b*
July					
3	2143	60	D	7−4, 9+1	10·9*b*
5	2145	45	Bh	7−1, 9+2	10·7
7	2147	90	,,	9+1	10·9*b*
13	2153	,,	,,	7−2, 9+2	10·8
15	2155	,,	,,	4−8, 7−1, 9+2	10·7
15	2155	120	Bn	7+1	10·4
15	2155	60	D	7−3, 9+3	10·8
20	2160	90	Bh	=7, 9+3	10·6
24	2164	,,	,,	5−1, 7+1	10·4*b*
24	2164	60	D	9−3	11·3
25	2165	90	Bh	4−3, =5, 7+3	10·2
29	2169	,,	,,	4−4, =5, 7+2	10·3
Aug					
5	2176	45	,,	4−3, 5+1, 7+2	10·2*b*
7	2178	90	,,	4−2, =5, 7+2	10·2
11	2182	,,	,,	4−5, =5, 7+3	10·3
14	2185	,,	,,	5−1, 7+1	10·4
16	2187	150	,,	4−4, 5−2, 7+2	10·4
19	2190	45	,,	7−1, 9+1	10·8*b*
21	2192	75	Bn	7 (3) v (1) 9	10·9
24	2195	45	Bh	=9	11·0
27	2198	90	,,	7−3, =9, 13+9	10·9*b*
27	2198	120	Bn	<9	<11·0
30	2201	90	Bh	7−5, =9	11·0*b*
Sept					
4	2206	,,	,,	7−6, 9−2, 13+8	11·2
6	2208	120	Bn	9−1	11·1*b*
7	2209	90	Bh	9−3, 13+6	11·3
10	2212	120	Br	9−5, 13+5	11·5
15	2217	90	Bh	9−5, 13+5	11·5
16	2218	60	D	<9	<11·0*b*
17	2219	90	Bh	9−8, 13+2	11·8*b*
19	2221	,,	,,	13−1	12·1*b*
20	2222	60	D	10−3	11·5*c*
23	2225	90	Bh	13+1	11·9
26	2228	,,	,,	13+2	11·8
26	2228	120	Bn	<9	<11·0*b*
27	2229	160	Br	13+2	11·8
28	2230	120	Bn	9 (3) v (1) 12	11·6*b*
Oct					
3	2235	150	Bh	=13	12·0*b*
13	2245	90	,,	=13	12·0*b*
14	2246	160	Br	=10, 13+5	11·3
15	2247	90	Bh	12+1, 13+2	11·8
21	2253	,,	,,	13+2	11·8
26	2258	120	Br	13+4	11·6
Nov					
10	2273	90	Bh	=9	11·0*c*
13	2276	,,	,,	9−2, 13+6	11·3
17	2280	,,	,,	9+1	10·9
24	2287	,,	,,	5−4, =7, 9+4	10·6
29	2292	,,	,,	6−3, 9+3	10·7

June 16, D, Difficult.
Aug. 27, Bn, t.
Sept. 6, t.
Sept. 20, About. Difficult.

1919					
Dec					
12	2305	90	Bh	5 (1) v (1) 9, =7	10·6
16	2309	,,	,,	5−1, 7+1	10·4
27	2320	,,	,,	4−3, =5, 7+4	10·2
1920					
Jan					
5	2329	90	Bh	4−3, =5, 7+3	10·2
14	2338	,,	,,	4−2, =5, 7+3	10·2
16	2340	,,	,,	5+2, 7+6	10·6
19	2343	75	Bn	7 (1) v (1) 9	10·8
21	2345	90	Bh	4−3, =5, 7+2	10·3
24	2348	,,	,,	4−2, 5+2	10·1
26	2350	,,	,,	4 (1) v (2) 9	10·3
26	2350	50	Bn	7 (1) v (1) 9	10·8
31	2355	,,	,,	7 (2) v (1) 9	10·8
31	2355	45	Bh	=5, =7	10·4
Feb					
5	2360	90	,,	5−3, =7, 9+5	10·5
11	2366	45	,,	5−3, 7+1	10·5
15	2370	,,	,,	5−3, =7, 9+3	10·6
16	2371	60	D	9−3, 12+7	11·2
17	2372	90	Bh	9+1	10·9
23	2378	,,	,,	9−1	11·1
27	2382	157	Th	9−4	11·4
Mar					
4	2388	90	Bh	9−5, 13+5	11·5
8	2392	,,	,,	9−6, 13+3	11·6
8	2392	157	Th	9−5, 13+3	11·6
11	2395	90	Bh	=13	12·0
12	2396	,,	,,	=13	12·0
16	2400	157	Th	13+1	11·9
18	2402	60	D	<13	<12·0
18	2402	120	Bn	12 (2) v (1) 14	12·0
22	2406	,,	,,	12 (2) v (1) 14	12·0
22	2406	60	D	13−4	12·4
22	2406	90	Bh	13+1	11·9
31	2415	,,	,,	13−2	12·2
Apr					
9	2424	,,	,,	13−3	12·3
11	2426	60	D	13−3	12·3
16	2431	90	Bh	13−5	12·5
21	2436	,,	,,	13−3	12·3
27	2442	,,	,,	=13	12·0
May					
4	2449	,,	,,	9−6, 13+4	11·6
7	2452	,,	,,	9−3, 13+6	11·8
7	2452	50	Bn	10 (2) v (1) 12	11·0
9	2454	120	Br	13+2	11·8
9	2454	60	D	9−5, 13+2	11·6
13	2458	90	Bh	9−1	11·1
14	2459	60	D	9−5, 13+2	11·6
14	2459	50	Bn	10 (2) v (1) 12	11·6
21	2466	,,	,,	9 (2) v (1) 10	11·1
21	2466	90	Bh	=9	11·0
23	2468	,,	,,	=9	11·0
23	2468	160	Br	9−4, 13+6	11·4
29	2474	120	Bn	7 (2) v (1) 9	10·8
June					
2	2478	90	Bh	9+2	10·8
4	2480	,,	,,	7−2, 9+2	10·8
8	2484	,,	,,	5−3, =7, 9+3	10·6
8	2484	120	Bn	7 (3) v (1) 9	10·9
8	2484	60	D	7−3, 9+2	10·8
8	2484	160	Br	9+2	10·8

Feb. 16, Difficult.
Feb. 17, Not steady.
Mar. 22, D, Very difficult.

(5338) U BOÖTIS—*continued.*

1920					
June					
11	2487	60	D	7−3, 9+3	10·8
14	2490	65	Mn	6 (1) v (1) 7	10·5*b*
15	2491	90	Bh	7+1	10·4
18	2494	,,	,,	5−2, 7+2	10·4
19	2495	65	Mn	7+0·5	10·5*c*
22	2498	60	D	7−2, 9+4	10·7
23	2499	90	Bh	7+1·	10·4
29	2505	,,	,,	4−3, =5, 7+3	10·2
July					
3	2509	65	Mn	4 (1) v (1) 5	10·1*b*
9	2515	60	D	7−1, 9+4	10·6
11	2517	90	Bh	=5, 7+3	10·2
14	2520	65	Mn	7−0·5	10·6*c*
16	2522	60	D	5−2, 7+1	10·4
18	2524	65	Mn	5 (1) v (2) 7, =6	10·4*b*
18	2524	95	Bn	4 (2) v (1) 5	10·1
18	2524	160	Br	5−3, 7+1	10·5
19	2525	60	D	5−1, 7+2	10·3
22	2528	75	Gi	=7	10·5
24	2530	65	Mn	5 (1) v (1) 6	10·3
24	2530	50	Bn	5 (2) v (1) 6	10·3
24	2530	90	Bh	=5, 7+3	10·2*b*
26	2532	,,	,,	5−3, =7, 9+3	10·6
29	2535	75	Gi	=4	10·0*b*
30	2536	90	Bh	4−3, =5, 7+3	10·2
Aug					
1	2538	65	Mn	=5	10·2
3	2540	75	Gi	4−1, 5+2	10·0
6	2543	90	Bh	5−2, 7+1, 9+2	10·6*b*
6	2543	160	Br	7−3, 9+2	10·8
8	2545	90	Bh	7+1, 9+5	10·5*b*
8	2545	60	D	=7	10·5*b*
9	2546	75	Bn	6 (1) v (1) 7	10·5
13	2550	60	Mn	7 (1) v (2) 9	10·7*b*
13	2550	90	Bh	7−1, 9+2	10·7
13	2550	75	Gi	=7	10·5
15	2552	75	Bn	7 (2) v (1) 9	10·8
19	2556	90	Bh	=7, 9+4	10·6*b*
20	2557	75	Bn	7 (1) v (1) 9	10·8
22	2559	60	Mn	7 (3) v (1) 9	10·9*b*
Sept					
1	2569	75	Gi	=9	11·0
4	2572	90	Bh	7−3, 9+1	10·9
6	2574	120	Bn	9−3, 10−1	11·3*b*
10	2578	85	Bn	10−1	11·3*b*
10	2578	60	Mn	13 (1) v (1) 14	12·0
12	2580	,,	D	9−4	11·4*b*
13	2581	150	Bh	9−3	11·3
15	2583	75	Gi	=13	12·0*b*
16	2584	60	Mn	13 (1) v (1) 14	12·0*b*
18	2586	95	Bn	10+0·5	11·1*b*
29	2597	90	Bh	9−5, 13+5	11·5
Oct					
1	2599	,,	,,	9−7, 13+3	11·7
1	2599	120	Br	15 (1) v (1) 16	12·2
6	2604	130	Mn	=17	12·3*b*
6	2604	117	Gi	13−3, =15	12·2*b*
6	2604	90	Bh	=13	12·0*b*
17	2615	,,	,,	=13	12·0*b*
18	2616	,,	,,	=13	12·0
20	2618	60	Mn	<13	<12·0
1920					
Oct					
30	2628	150	Bh	13−2	12·2
Nov					
11	2640	90	,,	13−2	12·2
16	2645	,,	,,	13−1	12·1*b*
20	2649	,,	,,	13−1	12·1
30	2659	45	,,	13+2	11·8
Dec					
7	2666	90	,,	9−3, 13+7	11·3*b*
12	2671	150	,,	9+1	10·9
21	2680	90	,,	5−2, =7, 9+2	10·6
25	2684	,,	,,	7+1	10·4
31	2690	,,	,,	5−2, =7, 9+2	10·6
1921					
Jan					
4	2694	117	Gi	7−2, 9+1	10·8
6	2696	45	Bh	7−2, 9+1	10·8
10	2700	90	,,	7−2, 9+1	10·8
13	2703	,,	,,	7−2, 9+2	10·8
13	2703	75	Bn	7 (3) v (1) 9	10·9
19	2709	,,	Gi	6−2·5, 10+2	10·8*b*
27	2717	90	Bh	7−5, =9	11·0
Feb					
1	2722	,,	,,	5−3, 7−1	10·6
4	2725	47	Gi	4−1·5, =5, 7+1	10·3
9	2730	90	Bh	=5, 7+2	10·3
17	2738	,,	,,	7−2, 9+2	10·8
19	2740	47	Gi	7−1·5, 9+1·5	10·8*b*
20	2741	90	Bh	7−2, 9+2	10·8
21	2742	45	,,	=7, 9+2	10·7
25	2746	90	,,	7+1	10·4
Mar					
2	2751	,,	,,	9−2, 13+6	11·3
2	2751	120	Bn	9 (1) v (2) 10	11·1
5	2754	117	Gi	=9	11·0*b*
6	2755	90	Bh	13+2	11·8*b*
11	2760	,,	,,	9−7, 13+3	11·7
14	2763	50	Bn	9 (2) v (1) 10	11·1
16	2765	90	Bh	9−6, 13+2	11·7
17	2766	117	Gi	9−6, 13+2·5	11·6
24	2773	90	Bh	13+1	11·9*b*
29	2778	,,	,,	13−1	12·1
30	2779	120	Bn	12 (3) v (1) 14	12·1
31	2780	117	Gi	13−2, =15	12·1
Apr					
1	2781	90	Bh	13−2	12·2
4	2784	60	D	<13	<12·0*b*
6	2786	85	Bn	14−2, =17	12·3
7	2787	90	Bh	13−2	12·2
8	2788	60	D	<13	<12·0
12	2792	90	Bh	13−3	12·3
15	2795	,,	,,	13−3	12·3
23	2803	,,	,,	13−2	12·2
26	2806	,,	,,	13−2	12·2
27	2807	120	Bn	14 (2) v (1) 17	12·2
29	2809	90	Bh	13−1	12·1
30	2810	160	Br	13−3	12·3
May					
6	2816	117	Gi	9−7, 13+2	11·7
7	2817	90	Bh	=13	12·0
9	2819	,,	,,	9−7, 13+2	11·7
9	2819	120	Bn	10 (5) v (2) 12	11·7
15	2825	90	Bh	9−5, 13+5	11·5
21	2831	,,	,,	9−4, 13+6	11·4
23	2833	,,	,,	9−3, 13+7	11·3
23	2833	50	Bn	10 (1) v (1) 12	11·5

Aug. 8, D, Difficult.
Sept. 6, t.
Sept. 12, Difficult.
Oct. 1, Br, Values of comp. stars taken from Hagen's Agg. al Cat., p. 252.

April 4, Difficult.

(5338) U BOÖTIS—*continued.*

1921					
May					
29	2839	60	D	<9	<11·0
30	2840	117	Gi	=9	11·0
31	2841	60	D	7−5, 9+1, 13+7	11·0
June					
2	2843	90	Bh	7−2, 9+2	10·8
5	2846	,,	,,	7−4, 9+4	10·8
5	2846	60	D	7−3, 9+3	10·8
7	2848	160	Br	7−1, 9+4	10·6
7	2848	120	Bn	9+1	10·9
10	2851	90	Bh	5−2, =7, 9+2	10·6
10	2851	75	Gi	7−1, 9+4	10·6
11	2852	50	Bn	7 (5) v (2) 9	10·9
18	2859	90	Bh	7+1	10·4
22	2863	117	Gi	4−2, 5+1	10·1*b*
23	2864	50	Bn	5 (1) v (2) 6	10·3
25	2866	60	D	7+2·5	10·3*b*
27	2868	90	Bh	7+3	10·2
28	2869	50	Bn	5 (2) v (1) 6	10·3
28	2869	60	D	5−1, 6+1, 7+3	10·3
July					
2	2873	75	Gi	5+0·5	10·2
3	2874	90	Bh	4−2, 5+2	10·1
4	2875	30	D	7−1, 9+4	10·6
5	2876	120	Bn	7 (3) v (1) 9	10·9
7	2878	160	Br	7−2	10·7
9	2880	60	D	7−1, 9+4	10·6
9	2880	120	Bn	7 (2) v (1) 9	10·8
11	2882	90	Bh	7+2	10·3
13	2884	117	Gi	4−2, 5+0·5	10·2
13	2884	60	D	7−3, 9+2	10·8*b*
18	2889	90	Bh	5−2, =7, 9+2	10·6
25	2896	120	Bn	5 (1) v (1) 6	10·3
25	2896	60	D	7+2	10·3*b*
26	2897	90	Bh	=5, 7+3	10·2
27	2898	117	Gi	=4	10·0
Aug					
6	2908	45	Bh	4+1	9·9
6	2908	75	Gi	4+2	9·8
8	2910	,,	Bn	4 (2) v (1) 5	10·1
15	2917	90	Bh	=4	10·0
19	2921	45	,,	4−1, =5, 7+5	10·1
25	2927	90	,,	=7	10·5
26	2928	117	Gi	=5	10·2
30	2932	90	Bh	7−2, 9+2	10·8
Sept					
3	2936	75	Bn	7 (2) v (1) 9	10·8
4	2937	60	D	7−3, 9+3	10·8*b*
5	2938	90	Bh	7−2, 9+3	10·7
7	2940	117	Gi	7−5, 9+2	10·9*b*
7	2940	75	Bn	7 (2) v (1) 9	10·8
21	2954	90	Bh	7−5, 9−1	11·1
24	2957	117	Gi	9−8, 13+2	11·8*b*
25	2958	120	Bn	10−2, 12+4	11·4*b*
Oct					
5	2968	90	Bh	9−2	11·2
6	2969	117	Gi	=17	12·3*b*
17	2980	90	Bh	<9	<11·0
21	2984	117	Gi	19−2	13·0*b*
23	2986	50	Bn	<10	<11·2
24	2987	90	Bh	9−6, 13+3	11·6
Nov					
1	2995	,,	,,	=13	12·0

May 31, Half-weight to third comparison.
Sept. 4, Difficult.
Oct. 17, Not seen.
Oct. 23, Seen.

1921					
Nov					
12	3006	90	Bh	13−2	12
17	3011	,,	,,	13−3	12
24	3018	,,	,,	13−2	12
28	3022	117	Gi	9−5, 13+2·5	11
Dec					
4	3028	90	Bh	=13	12
15	3039	,,	,,	9−4, 13+6	11
25	3049	,,	,,	=9	11
27	3051	117	Gi	=9	11
30	3054	90	Bh	7−4, =9	11
1922					
Jan					
1	3056	,,	,,	9−1, =10	11
3	3058	30	Bn	7 (3) v (1) 9	10
4	3059	60	D	9−3	11
7	3062	...	Gi	9 (2·5) v (4) 13	11
10	3065	90	Bh	9−3, 13+6	11
18	3073	,,	,,	9−2, 13+8	11
20	3075	,,	,,	9−3, 13+6	11
21	3076	,,	,,	9−2	11
21	3076	...	Gi	=9	11
Feb					
2	3088	90	Bh	9+1	10
4	3090	...	Gi	7 (2) v (2) 9	10
5	3091	90	Bh	9+1	10
17	3103	45	,,	=7, =9	10
25	3111	...	Gi	4+1·5	9
26	3112	90	Bh	4+1	9
Mar					
4	3118	,,	,,	=4, 5+4	9
10	3124	,,	,,	=5, 7+3	10
15	3129	,,	,,	5−3, =7	10
17	3131	...	Gi	7 (3) v (4) 9	10
19	3133	90	Bh	5−2, =7, 9+4	10
22	3136	,,	,,	7−2, 9+2	10
28	3142	,,	,,	7−3, 9+1	10
31	3145	,,	,,	9−3, 13+7	11
Apr					
1	3146	120	Bn	9−1, 10+0·5	11
4	3149	90	Bh	9−5, 13+5	11
9	3154	,,	,,	9−6, 13+3	11
13	3158	...	Gi	=11, 13+2	11
14	3159	90	Bh	13+1	11
17	3162	,,	,,	9−10, 13+1	11
19	3164	75	Bn	=14	12
29	3174	90	Bh	13−1	12
May					
2	3177	,,	,,	13−3	12
2	3177	120	Bn	17−3	12
8	3183	...	Gi	13−3, 15−1	12
8	3183	90	Bh	13−1	12
12	3187	,,	,,	13−3	12
15	3190	120	Bn	17 (1) v (1) 19	12
17	3192	150	Bh	13−3	12
19	3194	...	Gi	15 (2) v (1) 17	12
21	3196	120	Bn	14 (3) v (1) 17	12
27	3202	160	Br	15−1	12
27	3202	90	Bh	13−3	12
28	3203	62	D	13−2	12
31	3206	90	Bh	=13	12
June					
1	3207	120	Bn	17+1	12
4	3210	90	Bh	9−8, 13+2	11
12	3218	,,	,,	9−6, 13+3	11

Jan. 4, Difficult.
May 28, Difficult.

(5338) U BOÖTIS—*continued.*

1922 June 14	3220	...	Gi	9 (3·5) v (1·5) 13	11·7
19	3225	90	Bh	9−6, 13+3	11·6
27	3233	...	Gi	9 (5) v (2) 13	11·7
29	3235	90	Bh	9−5, 13+5	11·5
July 2	3238	45	,,	9−5, 13+5	11·5
11	3247	...	Gi	9 (4) v (3) 13	11·5
14	3250	90	Bh	9−3, 13+7	11·3
19	3255	120	Bn	10 (2) v (1) 12	11·6
20	3256	90	Bh	=9	11·0
21	3257	160	Br	13+3	11·7
22	3258	...	Gi	=9	11·0
27	3263	90	Bh	=9	11·0
30	3266	120	Bn	9 (1) v (2) 10	11·1
31	3267	90	Bh	7−3, 9+2	10·8
Aug 1	3268	...	Gi	=9	11·0
5	3272	45	Bh	=7	10·5
11	3278	90	,,	=5	10·2
12	3279	...	Gi	4−2, =5	10·2
17	3284	90	Bh	5−2, =7	10·5
20	3287	45	,,	=4, 7+5, 9+10	10·0*b*
22	3289	...	Gi	4+1·5	9·8
23	3290	75	Bn	5 (1) v (2) 6	10·3
23	3290	90	Bh	4+1	9·9
25	3292	,,	,,	=4, 5+3, 7+5	10·0
25	3292	45	Br	=4	10·0
31	3298	90	Bh	=4	10·0
Sept 4	3302	,,	,,	4+1, 5+4	9·8
7	3305	,,	,,	=4	10·0
10	3308	,,	,,	4−1, 5+2	10·0
15	3313	,,	,,	5−1, 7+2	10·3
15	3313	75	Bn	4 (2) v (1) 5	10·1
17	3315	...	Gi	4 (1) v (2) 5	10·0
21	3319	90	Bh	=7	10·5
Oct 6	3334	,,	,,	7−1	10·6
12	3340	,,	,,	7−2, 9+2	10·8*b*
14	3342	,,	,,	7−5, 9−1	11·1
18	3346	193	Li	13 (5) v (5) 14	12·0*b*
20	3348	90	Bh	7−6, 9−2	11·2
25	3353	,,	,,	9−5, 13+5	11·5*b*
Nov 1	3360	,,	,,	9−6, 13+3	11·6*b*
1	3360	...	Gi	9 (4) v (2) 13	11·6
4	3363	90	Bh	9−7, 13+3	11·7
14	3373	,,	,,	9−8, 13+2	11·8
24	3383	,,	,,	9−5, 13+5	11·5
Dec 16	3405	150	,,	13−2	12·2
1923 Jan 4	3424	90	,,	=13	12·0*b*
11	3431	,,	,,	13+2	11·8
17	3437	117	Gi	9 (5·5) v (2) 12, 13+2	11·7
27	3447	90	Bh	9−2, 13+7	11·2
Feb 4	3455	,,	,,	7−4, =9	11·0
8	3459	,,	,,	5−2, =7, 9+3	10·6
16	3467	,,	,,	5−2, 7+1	10·4
Mar 2	3481	,,	,,	=7, 9+3	10·6
5	3484	,,	,,	9+2	10·8
13	3492	,,	,,	5−3, =7, 9+3	10·6
1923 Mar 15	3494	117	Gi	7 (2) v (3) 9	10·7
17	3496	90	Bh	=9	11·0
21	3500	,,	,,	=7	10·5
25	3504	,,	,,	9+1	10·9
26	3505	60	D	9−4	11·4
Apr 5	3515	117	Gi	7 (3) v (1·5) 9	10·8
8	3518	90	Bh	=9	11·0
9	3519	75	Bn	7 (4) v (1) 9	10·9
13	3523	90	Bh	7−3, 9+1	10·9
14	3524	60	D	7−4, 9+1	10·9
14	3524	193	Li	=9	11·0*b*
17	3527	90	Bh	7−4, 9+1	10·9
23	3533	60	D	7−4, =9	11·0
25	3535	117	Gi	7 (3·5) v (2) 9	10·8
May 1	3541	90	Bh	9−1	11·1
3	3543	,,	,,	9−1	11·1
5	3545	60	D	9−0·5	11·0
8	3548	90	Bh	9−2	11·2
11	3551	117	Gi	=9	11·0
12	3552	44	Li	=7	10·5
13	3553	60	D	7−4, 9+1	10·9
17	3557	90	Bh	9−5, 13+5	11·5
24	3564	60	D	9−1	11·1
June 2	3573	90	Bh	9−4, 13+6	11·4
6	3577	60	D	9 (4) v (1) 13, 13+3	11·7
10	3581	,,	,,	13−2	12·2*b*
10	3581	193	Li	13 (5) v (5) 14	12·0
11	3582	117	Gi	13 (3) v (1·5) 15	12·1
18	3589	60	D	13−3	12·3
23	3594	90	Bh	13+1	11·9*b*
July 1	3602	,,	,,	13−1	12·1*b*
4	3605	117	Gi	=13	12·0*b*
6	3607	60	D	=13	12·0
7	3608	120	,,	13+2	11·8
14	3615	90	Bh	13+4	11·6
17	3618	117	Gi	9−4, 13+4	11·5
20	3621	60	D	9−2	11·2*b*
21	3622	193	Li	9 (9) v (1) 13	11·9
30	3631	90	Bh	9−3, 13+7	11·3
Aug 1	3633	,,	,,	=9	11·0
3	3635	,,	,,	7−3, 9+1	10·9
4	3636	120	Bn	7 (2) v (1) 9	10·8
9	3641	90	Bh	=7	10·5
11	3643	120	Bn	=7	10·5
11	3643	60	D	7−2, 9+4	10·7
15	3647	90	Bh	=5, 7+3	10·2
18	3650	,,	,,	4−2, 5+1, 7+3, 9+8	10·2
26	3658	,,	,,	4−2, 5+2	10·1
Sept 1	3664	60	D	=6, 7+2	10·4
2	3665	90	Bh	4−2, 5+2, 7+4	10·1
5	3668	120	Bn	5 (4) v (1) 6	10·3
8	3671	90	Bh	4−2, 5+2, 7+4	10·1
11	3674	,,	,,	5−7, 7+2	10·6
11	3674	50	Bn	5 (2) v (1) 6	10·3
12	3675	60	D	6−4	10·8
15	3678	120	Bn	5 (2) v (1) 6	10·3
16	3679	90	Bh	=7	10·5*b*

Oct. 18, Difficult.

Mar. 26, Difficult.
April 14, Li, June 10, D, Difficult.

(5338) U BOÖTIS—*continued.*

1923					
Sept					
22	3685	90	Bh	7−1, 9+3	10·7
26	3689	,,	,,	7−1	10·6
29	3692	120	Bn	4−3, =5	10·2
30	3693	60	D	7−1, 9+4	10·6
Oct					
1	3694	90	Bh	7−2, 9+2	10·8
5	3698	,,	,,	=9	11·0
14	3707	120	Bn	4 (3) v (1) 5	10·2
19	3712	90	Bh	7−9, 9−5, 13+5	11·5
Nov					
7	3731	45	,,	13+1	11·9*b*
9	3733	90	,,	13+1	11·9*b*
19	3743	,,	,,	9−4, 13+6	11·4
1924					
Jan					
3	3788	,,	,,	9−3	11·3
5	3790	,,	,,	9−1	11·1
6	3791	120	Bn	12+1	11·8
11	3796	90	Bh	9−1	11·1
16	3801	,,	,,	9−2	11·2
23	3808	45	,,	9−2	11·2*b*
26	3811	90	,,	9−4, 13+6	11·4
31	3816	,,	,,	9−3, 13+7	11·3
Feb					
1	3817	60	D	9 (3) v (1) 13, 13+3	11·7*b*
8	3824	,,	,,	9−3	11·3*b*
11	3827	45	Bh	9−4, 13+6	11·4*b*
14	3830	60	D	9−2	11·2*b*
15	3831	90	Bh	9−4, 13+6	11·4
16	3832	50	Bn	9 (2) v (1) 10	11·1
18	3834	90	Bh	9−2	11·2*b*
22	3838	,,	,,	9+1	10·9
24	3840	,,	,,	7 (1) v (1) 9	10·8
26	3842	,,	,,	7 (2) v (1) 9	10·8
Mar					
2	3847	,,	,,	=9	11·0
4	3849	,,	,,	9+1	10·9
4	3849	60	D	9−1	11·1
7	3852	90	Bh	7 (1) v (1) 9	10·8
8	3853	50	Bn	7 (2) v (1) 9	10·8
8	3853	60	D	7−4, 9+1	10·9
8	3853	68	Ha	7 (1) v (4) 9	10·6
9	3854	90	Bh	=7	10·5
10	3855	,,	,,	7−1	10·6
11	3856	60	D	7−4, 9+2	10·9
14	3859	90	Bh	5−3, =7	10·5*b*
19	3864	45	,,	5−3, =7	10·5*b*
22	3867	,,	,,	=5	10·2
26	3871	90	,,	4−3, =5, 7+3	10·2
29	3874	,,	,,	=5	10·2
30	3875	60	D	5−3, 7+1	10·5
30	3875	50	Bn	4 (3) v (2) 5	10·1
Apr					
2	3878	18	Sg	4 (1) v (1) 6	10·2*b*
2	3878	90	Bh	=5	10·2
4	3880	,,	,,	5+1	10·1
4	3880	60	D	4−3, 7+2	10·3
4	3880	50	Bn	4 (3) v (1) 5	10·2
6	3882	90	Bh	=5	10·2
7	3883	50	Bn	5−0·5, 6+1	10·3
8	3884	90	Bh	5+1	10·1
9	3885	50	Bn	=5	10·2
11	3887	60	D	4−4, 7+1	10·4

Feb. 1, 8, Difficult.
Feb. 14, About.
Mar. 29, Yellow.

1924					
Apr					
11	3887	90	Bh	5−1	10·
20	3896	45	,,	=7	10·
21	3897	68	Ha	5 (3) v (2) 7	10·
25	3901	45	Bh	7−1, 9+3	10·
27	3903	68	Ha	5 (4) v (1) 7	10·
29	3905	,,	,,	=7	10·
30	3906	90	Bh	7−1	10·
May					
4	3910	60	D	7−1, 9+4	10·
4	3910	68	Ha	7 (1) v (4) 9	10·
5	3911	50	Bn	5 (2) v (1) 6	10·
5	3911	45	Bh	=7	10·
7	3913	60	D	7−1, 9+4	10·
9	3915	,,	,,	7−3, 9+3	10·
13	3919	,,	,,	7−3, 9+3	10·
13	3919	45	Bh	5 (1) v (1) 9	10·
16	3922	,,	,,	=7	10·
21	3927	60	D	4−4, 7+1	10·
22	3928	90	Bh	=9	11·
24	3930	60	D	4−5, 7+1	10·
27	3933	50	Bn	5 (1) v (1) 6	10·
27	3933	68	Ha	=7	10·
27	3933	90	Bh	9+5	10·
30	3936	60	D	4−4, 7+2	10·
31	3937	90	Bh	5−2, 7+1, 9+5	10·
June					
1	3938	60	D	=7	10·
5	3942	,,	,,	=7	10·
8	3945	68	Ha	7 (1) v (2) 9	10·
9	3946	60	D	7−1·5, 9+4	10·
13	3950	150	Bh	9 (1) v (4) 13	11·
17	3954	60	D	7−3, 9+3	10·
18	3955	45	Bh	9−2	11·
21	3958	60	D	7−3, 9+3	10·
23	3960	,,	,,	7−5, 9+1	11·
23	3960	68	Ha	7 (3) v (2) 9	10·
26	3963	90	Bh	9−5	11·
26	3963	60	D	7−5, 9+1	11·
29	3966	,,	,,	9−2, =10	11·
30	3967	90	Bh	9 (1) v (1) 13	11·
July					
5	3972	60	D	10−2, 13+5	11·
6	3973	,,	,,	10−3, 12+4	11·
6	3973	121	Ha	=9	11·
9	3976	120	D	13+3	11·
11	3978	90	Bh	9 (1) v (1) 13	11·
11	3978	121	Ha	9 (3) v (2) 13	11·
13	3980	,,	,,	9 (4) v (1) 10	11·
13	3980	120	Bn	9−5, 10−2	11·
16	3983	121	Ha	9 (3) v (2) 13	11·
21	3988	120	Bn	14 (3) v (2) 17	12·
23	3990	90	Bh	9 (3) v (2) 13	11·
24	3991	121	Ha	13 (3) v (2) 14	12·
26	3993	90	Bh	9 (4) v (1) 13	11·
29	3996	121	Ha	13 (3) v (2) 17	12·
29	3996	50	Bn	12+1	11·
30	3997	90	Bh	9 (3) v (1) 13	11·
Aug					
2	4000	45	,,	9 (4) v (1) 13	11·
2	4000	120	Bn	=12	11·
7	4005	,,	,,	12 (2) v (1) 14	12·
17	4015	,,	D	13−3	12·
18	4016	121	Ha	13 (3) v (2) 17	12·
22	4020	45	Bh	13−1	12·

June 17, Difficult.
July 9, Difficult.

(5338) U BOÖTIS—*continued.*

924						1924					
ept						Oct					
2	4031	150	Bh	13−1	12·1	31	4090	90	Bh	5−4, 7−1	10·6
9	4038	121	Ha	13 (4) v (1) 17	12·2	Nov					
14	4043	90	Bh	=13	12·0	3	4093	,,	,,	7−1	10·6
16	4045	,,	,,	9 (4) v (1) 13	11·8	4	4094	121	Ha	5 (1) v (2) 7	10·3*b*
24	4053	50	Bn	9−3	11·3*b*	5	4095	90	Bh	7−1	10·6
27	4056	120	,,	9 (2) v (1) 10	11·1	16	4106	,,	,,	5−5, 7−2	10·7
27	4056	121	Ha	7 (4) v (1) 9	10·9	Dec					
ct						1	4121	,,	,,	5−5, 7−2	10·7
1	4060	,,	,,	7 (3) v (2) 9	10·8	4	4124	,,	,,	7 (1) v (1) 9	10·8
6	4065	90	Bh	9 (2) v (1) 13	11·6	6	4126	60	D	7−3, 9+2	10·8
8	4067	,,	,,	9 (1) v (4) 13	11·2	9	4129	94	Li	5 (8) v (2) 7	10·5*b*
8	4067	120	Bn	7 (1) v (3) 9	10·7	13	4133	90	Bh	=7	10·5
13	4072	121	Ha	5 (4) v (1) 7	10·5	19	4139	,,	,,	4 (1) v (1) 7, =5	10·2
15	4074	90	Bh	9+1	10·9	22	4142	60	D	=7	10·5
22	4081	95	Bn	=4, 5+2	10·0	24	4144	90	Bh	4 (1) v (1) 5	10·1
23	4082	121	Ha	4 (2) v (3) 5	10·1*b*	24	4144	50	Bn	5 (1) v (1) 7, 6+2	10·3
24	4083	45	Bh	=7	10·5*b*	28	4148	,,	,,	=5, 6+1·5	10·2

(5194) V BOÖTIS. (V. 5.)

H.D. 142539.

Star P = B.D. + 39° 2760, 7^{m}·17, **H.A., 54,** 156.
,, N = ,, + 39° 2749, 6·48, ,, **50,** 125.

Date.	Julian Date.	Inst.	Observer.	Comparisons.	Deduced Mag.	Date.	Julian Date.	Inst.	Observer.	Comparisons.	Deduced Mag.
920						1920					
Jn						Feb					
1	2325	30	Bn	3 (3) v (1) 5	8·3	17	2372	45	Bh	3+2	7·4
5	2329	45	Bh	5+2	8·4*b*	18	2373	30	D	3+1	7·5*b*
5	2329	22	Bl	3 (1) v (6) 5	7·8	18	2373	23	Bo	2 (9) v (1) 3	7·5
8	2332	30	Bn	3+1	7·5	22	2377	,,	,,	=3	7·6
11	2335	22	Bl	P (2·5) v (1·5) 3	7·5	23	2378	30	D	=3	7·6
14	2338	30	D	3−2, 4+3	7·8*b*	23	2378	45	Bh	3+2	7·4
15	2339	45	Bh	5+6	8·0	27	2382	,,	,,	3+2	7·4
16	2340	23	Bo	=3	7·6	27	2382	23	Bo	2 (4) v (1) 3	7·4
19	2343	,,	,,	=3	7·6	28	2383	22	Bl	P (3) v (1) 3	7·5
19	2343	22	Bl	P (3·5) v (1·5) 3	7·5	Mar					
21	2345	,,	,,	P (2) v (2) 3	7·4	2	2386	30	Bn	3 (1) v (1) 5	8·1
21	2345	30	D	3−0·5	7·7	4	2388	23	Bo	2 (9) v (1) 3	7·5
21	2345	45	Bh	3−2, 6+7	7·8	4	2388	22	Bl	=3	7·6
23	2347	23	Bo	2 (19) v (1) 3	7·6	7	2391	30	Tn	3 (7) v (3) 6	8·3
23	2347	22	Bl	P (1·5) v (2·5) 3	7·3	8	2392	,,	Bn	3 (7) v (2) 5	8·3
24	2348	30	Bn	3+2	7·4	8	2392	45	Bh	=3	7·6
24	2348	45	Bh	3+2	7·4	10	2394	30	Tn	3 (5) v (5) 6	8·1*b*
26	2350	,,	,,	3+4	7·2	11	2395	45	Bh	=3	7·6
31	2355	23	Bo	2 (9) v (1) 3	7·5	12	2396	30	D	3−3, 4+1	7·9*b*
31	2355	30	Bn	3+3	7·3	12	2396	23	Bo	2 (15) v (1) 3	7·5
Feb						12	2396	30	Bn	3 (4) v (1) 5	8·4
2	2357	22	Bl	P (4) v (1·5) 3	7·5	13	2397	,,	Tn	3 (7) v (3) 6	8·3*b*
5	2360	,,	,,	=3	7·6	13	2397	45	Bh	3−1	7·7*b*
5	2360	23	Bo	2 (3) v (1) 3	7·3	13	2397	22	Bl	3 (3) v (2) 5	8·2
5	2360	45	Bh	3+3	7·3	15	2399	30	Tn	3 (7) v (3) 6	8·3
8	2363	30	Bn	3+2·5	7·4	17	2401	45	Bh	3+1	7·5
11	2366	23	Bo	=3	7·6	18	2402	30	Bn	5+1	8·5
11	2366	45	Bh	3+2	7·4	18	2402	,,	D	4−1, 5+5	8·1*b*
14	2369	22	Bl	P (2·5) v (1·5) 3	7·5	19	2403	23	Bo	3 (1) v (1) 4	7·8
15	2370	45	Bh	3+2	7·4	20	2404	50	Bn	5+1·5	8·4
16	2371	23	Bo	2 (9) v (1) 3	7·5						
16	2371	30	D	3+1	7·5*b*						
17	2372	45	Br	3+1	7·5						
17	2372	30	Bn	3+3	7·3						

Mar. 17, Orange.
Mar. 18, D, Difficult.

(5194) V BOÖTIS—*continued.*

1920					
Mar					
22	2406	90	Bh	=3	7·6
22	2406	30	D	4−2, 5+4	8·2
22	2406	,,	Tn	3 (7) v (3) 6	8·3*b*
22	2406	22	Bl	3 (4·5) v (2·5) 5	8·2
29	2413	,,	,,	3 (6) v (1) 5	8·4
30	2414	23	Bo	4 (3) v (1) 5	8·4
31	2415	45	Bh	3−3, 5+5	8·0
Apr					
6	2421	23	Bo	4 (4) v (1) 5	8·4
6	2421	30	D	4−2·5, 5+3·5	8·2*b*
10	2425	22	Bl	=5	8·6
11	2426	30	D	5−3, 11+2	8·9
12	2427	90	Bh	5−2	8·8
15	2430	23	Bo	6 (1) v (2) 7	8·6
15	2430	22	Bl	5 (2·5) v (4·5) 11	8·8
17	2432	90	Bh	5−3, 9+3, 10+3	8·8
19	2434	50	Ma	11 (1) v (3) 16	9·3
21	2436	45	Br	5−3, 9+2	8·9
21	2436	30	Bn	7 (2) v (1) 8	8·8
21	2436	90	Bh	9+1, 10+1	9·0
21	2436	30	D	11+1	9·1*b*
22	2437	,,	Tn	7 (5) v (5) 11	9·0*b*
27	2442	90	Bh	9−1, 11+1	9·1
27	2442	22	Bl	5 (4) v (1) 11	9·1
28	2443	50	Ma	9 (1) v (2) 11	9·1
29	2444	30	Bn	7 (3) v (1) 8	8·8
May					
4	2449	22	Bl	11 (3) v (5) 16	9·4
4	2449	50	Ma	11−3	9·5
4	2449	90	Bh	=11	9·2
7	2452	,,	,,	=11	9·2
7	2452	30	D	9−2·5, 16+4·5	9·3
7	2452	50	Ma	9+2, 11−2, 16+4	9·2
9	2454	,,	,,	11 (3) v (1) 16	9·6
9	2454	45	Br	=9, 11+2	9·0
10	2455	30	D	9−1, 16+6	9·2
10	2455	94	Bl	11 (6) v (1) 16	9·7
13	2458	90	Bh	=11	9·2
14	2459	50	Bn	9 (2) v (1) 13, 11−0·5	9·2
14	2459	30	D	9−3, 16+5	9·3
14	2459	50	Ma	11 (1) v (1) 16	9·5
21	2466	,,	Bn	9 (2) v (1) 16	9·5
21	2466	94	Bl	11 (6) v (1) 16	9·7
21	2466	90	Bh	11−1	9·3
23	2468	,,	,,	11−1	9·3
23	2468	45	Br	11−0·5	9·2
29	2474	50	Bn	17 (1) v (2) 18	10·0
June					
2	2478	90	Bh	=15	9·5
4	2480	,,	,,	15−1, 16+2	9·6*b*
8	2484	,,	,,	16−1	9·9
8	2484	45	Br	11−5, 16+1	9·7
8	2484	75	Bn	17 (3) v (2) 18	10·1
8	2484	22	Bl	16 (1) v (5) 21	9·9
8	2484	30	D	16−4, 19+3	10.1
11	2487	,,	,,	16−4, 19+2	10·2
15	2491	90	Bh	17−2, 18+1	10·1
18	2494	,,	,,	15−6, 17−2, =18	10·2
18	2494	94	Bl	16 (6) v (2) 21	10·6
20	2496	45	Br	17−1, 19+2	10·1
22	2498	30	D	16−5, 19+1	10·3*b*
23	2499	90	Bh	16−4, 17−2, 18+1	10·1
29	2505	,,	,,	18+1	10·1

Mar. 22, Bh, Orange.
April 19, Ruddy.

1920					
July					
9	2515	30	D	16−5, 19+1	10·3
11	2517	90	Bh	18−2, 20+2	10·4
14	2520	94	Bl	=21	10·8
15	2521	50	Ma	16 (3) v (1) 23, 23+2	10·9
15	2521	90	Bh	18−2, 20+2	10·4
16	2522	30	D	19−1	10·5
17	2523	45	Br	19−2	10·6
18	2524	50	Bn	20 (1) v (1) 21	10·7
24	2530	,,	,,	20 (1) v (3) 21	10·6
24	2530	,,	Ma	23+2	11·0
24	2530	94	Bl	=21	10·8
26	2532	90	Bh	17−6, =20, 21+3	10·5
28	2534	50	Ma	22−1, 23+2·5	11·0
30	2536	90	Bh	18−2, 20+2	10·4
Aug					
1	2538	50	Ma	16 (1) v (1) 25	10·6
6	2543	90	Bh	17−1, 18+1	10·1
8	2545	30	D	16−3	10·1
8	2545	90	Bh	=18	10·2
9	2546	75	Bn	17 (3) v (2) 18	10·1
9	2546	50	Ma	9 (3) v (1) 19	10·0
13	2550	22	Bl	11 (5) v (1) 16	9·7
13	2550	90	Bh	15−2, =16, 17+1	9·8
15	2552	75	Bn	16 (1) v (1) 17	9·9
15	2552	50	Ma	16+1	9·7
16	2553	30	D	16−3, 19+5	10·0
16	2553	23	Bo	11 (1) v (1) 15	9·3
16	2553	80	Co	16−3, 18+1	10·1
17	2554	,,	,,	16−2, =17	10·0
19	2556	,,	,,	15−1, 16+1	9·6
19	2556	90	Bh	=15	9·5
20	2557	30	Bn	16 (1) v (1) 17	9·9
22	2559	80	Co	15−2, 16+2	9·6
22	2559	50	Ma	9−1	9·2
25	2562	30	D	=9, 11+2	9·0
29	2566	90	Bh	=9, =10, 11+2	9·0
29	2566	30	Tn	7 (5) v (5) 11	9·0
Sept					
1	2569	90	Bh	=5, =6	8·6
4	2572	,,	,,	5+2	8·4
4	2572	80	Co	10+2, 11+3	8·9
4	2572	50	Ma	9+6, 16+9	8·7
6	2574	,,	,,	9+5, 11+4, 16+7	8·8
6	2574	30	Tn	3 (7) v (3) 6	8·3
6	2574	,,	Bn	3 (2) v (1) 5	8·2
6	2574	80	Co	7−1, =8, 11+3	8·9
8	2576	23	Bo	3 (2) v (1) 6	8·2
8	2576	30	Tn	3 (7) v (3) 6	8·3
10	2578	80	Co	=6, 7+1	8·6
10	2578	30	Bn	3 (1) v (3) 5	7·9
11	2579	45	Br	5+3	8·3
12	2580	23	Bo	3 (3) v (1) 5	8·3
12	2580	80	Co	=5, 7+1	8·6
12	2580	30	D	3−2, 4+2	7·8
13	2581	,,	Tn	3 (3) v (7) 6, 3−3	7·9
13	2581	50	Ma	11+7	8·9
13	2581	45	Bh	=3	7·6
15	2583	30	Tn	3−2	7·8
16	2584	22	Bl	P (2·5) v (0·5) 3	7·6
16	2584	80	Co	6+2	8·2
18	2586	,,	,,	4−2, 5+3	8·2
18	2586	30	Bn	3+1	7·5

Aug. 8, D, Difficult.
Sept. 10, Co, Whitish.
Sept. 12, Co, Rather orange.
Sept. 12, D, Difficult.

(5194) V BOÖTIS—*continued.*

1920 Sept					
18	2586	45	Bh	3+5	7·1
19	2587	23	Bo	=3	7·6
19	2587	80	Co	=4	8·0
19	2587	30	Tn	=3	7·6
21	2589	,,	,,	3+2	7·4
24	2592	,,	,,	3+3	7·3
26	2594	45	Bh	2−8, 3+5	7·1
27	2595	30	Bn	3+3	7·3
29	2597	45	Bh	2−8, 3+5	7·1
29	2597	23	Bo	2 (4) v (1) 3	7·4
30	2598	30	Tn	3+3	7·3*b*
Oct					
1	2599	60	Co	4+3	7·7
4	2602	22	Bl	N (2) v (1) P	6·9
5	2603	23	Bo	2 (2) v (1) 3	7·2
6	2604	45	Bh	3+5	7·1
7	2605	60	Co	=3	7·6
9	2607	23	Bo	2 (3) v (1) 3	7·3
9	2607	30	Bn	3+3	7·3
9	2607	,,	D	2 (4) v (1) 3, 3+3	7·4
12	2610	45	Bh	3+5	7·1
12	2610	60	Co	3+3	7·3
12	2610	30	Tn	3+4	7·2*b*
14	2612	23	Bo	2 (4) v (1) 3	7·4
18	2616	45	Bh	2−10, 3+3	7·3
18	2616	60	Co	3+3	7·3
19	2617	,,	,,	3+1·5	7·5
20	2618	23	Bo	2 (2) v (1) 3	7·2
20	2618	30	Bn	3+3	7·3
20	2618	22	Bl	N (2·5) v (2·5) P	6·8
22	2620	45	Bh	3+3	7·3
24	2622	30	Bn	3+3	7·3
24	2622	,,	D	2 (5) v (1) 3, 3+2	7·4*b*
24	2622	,,	Tn	3+3	7·3
25	2623	,,	,,	=3	7·6
25	2623	60	Co	3+1	7·5
26	2624	30	Tn	3−2	7·8
26	2624	23	Bo	3+1	7·5
27	2625	30	Bn	3+3	7·3
29	2627	22	Bl	N (1) v (3) P	6·7
29	2627	45	Bh	3+3	7·3
29	2627	60	Co	3+1	7·5*b*
30	2628	45	Br	3+4	7·2
Nov					
1	2630	30	Bn	3+3	7·3
1	2630	,,	D	2 (5) v (1) 3, 3+2	7·4*b*
7	2636	55	Bo	2 (4) v (1) 3	7·4
8	2637	45	Bh	=3	7·6
8	2637	22	Bl	N (2·5) v (1·5) P	6·9
13	2642	45	Bh	3+3	7·3
16	2645	30	Bn	3+2	7·4
17	2646	22	Bl	N (4) v (1) P	7·0
18	2647	45	Br	3−3, 5+6	7·9*b*
18	2647	23	Bo	3 (1) v (9) 5	7·7
20	2649	45	Bh	3+1	7·5
21	2650	30	Bn	3+1·5	7·5
22	2651	23	Bo	3 (1) v (4) 5	7·8
24	2653	60	Co	3−1, 4+3	7·7
30	2659	45	Bh	3−1	7·7
Dec					
1	2660	60	Co	3−2, 4+2	7·8
2	2661	45	Bh	3−1	7·7

Oct. 1, 7, Yellow.
Oct. 12, Co, Orange-yellow.
Oct. 18, Co, Rich yellow.
Oct. 19, 25, Co, Yellow.

1920 Dec					
3	2662	30	Tn	3 (5) v (5) 6	8·1
7	2666	45	Bh	3−2	7·8
9	2668	60	Co	3−3, 4+1	7·9
12	2671	45	Bh	3−1	7·7
14	2673	22	Bl	3 (4·5) v (1·5) 5	8·3
14	2673	30	Tn	3 (7) v (3) 6	8·3
21	2680	90	Bh	3−3, 5+5	8·0
25	2684	45	,,	3−4, 5+4	8·1
31	2690	,,	,,	3−5, 5+5, 6+5	8·1
1921 Jan					
6	2696	,,	,,	5−2, 6+2	8·8
6	2696	30	Tn	=8	8·9
9	2699	80	Co	=8, 11+2·5	8·9*b*
10	2700	30	Bn	6 (2) v (1) 7	8·7
11	2701	80	Co	8+1, 11+2	8·9*b*
12	2702	22	Bl	=11	9·2
12	2702	55	Bo	5 (1) v (3) 9	8·7*b*
13	2703	90	Bh	5−2, =7, 9+3	8·8
13	2703	30	Tn	11+2	9·0
16	2706	,,	D	9+1	9·0*b*
16	2706	23	Bo	=8	8·9
19	2709	22	Bl	5 (4) v (1) 11	9·1
27	2717	90	Bh	=9, =10	9·1
30	2720	45	,,	=10, =11	9·1*b*
31	2721	50	Bn	9 (2) v (1) 11	9·1
Feb					
2	2723	90	Bh	=11	9·2
2	2723	60	Co	=11	9·2
4	2725	23	Bo	8 (3) v (1) 9	9·0
9	2730	60	Co	11−3, 16+3	9·5
9	2730	90	Bh	15−2, =16, 17+2	9·7
10	2731	30	Tn	=9	9·1*b*
14	2735	60	Co	16+1	9·7
16	2737	22	Bl	11 (3) v (3) 16	9·5
17	2738	90	Bh	=17	10·0
17	2738	45	Br	11−3, 16+3	9·5
19	2740	55	Bo	9 (4) v (1) 11	9·2*b*
20	2741	90	Bh	15−2, =16, 17+2	9·7*b*
21	2742	45	,,	=16, 17+2	9·8
23	2744	22	Bl	11 (6) v (1) 16, =16	9·7
24	2745	55	Bo	11 (3) v (1) 16	9·6
25	2746	90	Bh	16−1, 17+1	9·9
25	2746	30	Tn	=9	9·1
26	2747	50	Bn	11 (2) v (1) 13	9·2
26	2747	60	Co	=16	9·8
Mar					
2	2751	48	Wi	9−4, 16+4	9·4
2	2751	22	Bl	11 (5) v (1) 16	9·7
2	2751	30	Tn	=17	10·0
2	2751	60	Co	16−2, =17	10·0
2	2751	55	Bo	11 (3) v (1) 15	9·4*b*
2	2751	90	Bh	=16	9·8
6	2755	,,	,,	15−3, =16, 17+3	9·7
9	2758	55	Bo	15 (3) v (1) 18	10·0
10	2759	50	Bn	17 (1) v (3) 18	10·0
10	2759	22	Bl	11 (5) v (1) 16	9·7
10	2759	48	Wi	9−7, 16+1	9·7
11	2760	90	Bh	15−4, 16−1	9·9
15	2764	55	Bo	18 (1) v (3) 20	10·3
16	2765	90	Bh	17−1, 18+1	10·1
18	2767	50	Bn	17 (1) v (2) 18	10·0
18	2767	60	Co	17−2	10·2
20	2769	94	Bl	=16	9·8

Jan. 16, D, Not sure.
Mar. 18, Co, Doubtful.
Mar. 20, With 22, 9·9.

(5194) V BOÖTIS—*continued.*

1921					
Mar					
21	2770	90	Bh	=17	10·0
24	2773	45	,,	=17	10·0
24	2773	50	Bn	17 (1) v (3) 18	10·0
24	2773	22	Bl	16–2	10·0
24	2773	48	Wi	16–4	10·2
26	2775	,,	,,	16–2, 19+4	10·0
26	2775	60	Co	=18	10·2
29	2778	,,	,,	18–1, 20+3	10·3
29	2778	90	Bh	17–1	10·1
30	2779	55	Bo	18 (3) v (1) 20	10·5
30	2779	50	Bn	16 (3) v (1) 17	9·9
30	2779	,,	Ma	=16	9·8
30	2779	48	Wi	16–5, 19+1	10·3
31	2780	60	Co	=18, 20+4	10·2
Apr					
1	2781	48	Wi	16–3, 19+3	10·1
1	2781	22	Bl	16 (1) v (4) 21	10·0
1	2781	45	Bh	17–1	10·1
2	2782	55	Bo	18 (3) v (1) 20	10·5
3	2783	30	D	16–3, 19+3	10·1
4	2784	75	Bn	16 (3) v (1) 17	9·9
6	2786	80	Co	18–1	10·3*c*
7	2787	55	Bo	18 (3) v (1) 20	10·5
7	2787	45	Bh	17–1, 18+1	10·1
7	2787	48	Wi	16–3, 19+3	10·1
8	2788	,,	,,	16–4, 19+2	10·2
8	2788	50	Ma	16+1	9·7
8	2788	30	D	16–3, 19+4	10·0
10	2790	80	Co	=18, 19+2	10·2
10	2790	50	Ma	9 (4) v (1) 16	9·6
10	2790	30	Tn	=19	10·4
11	2791	22	Bl	16 (3) v (3) 21	10·3
11	2791	30	D	9–5, 16+2	9·6*b*
12	2792	80	Co	=18, 19+2	10·2
12	2792	55	Bo	18 (1) v (3) 20	10·3
12	2792	75	Bn	16 (2) v (1) 17	9·9
12	2792	45	Bh	=17	10·0
14	2794	50	Ma	16 (1) v (1) 17	9·9
15	2795	90	Bh	17–1, 18+2	10·0
16	2796	22	Bl	16 (1) v (4) 21	10·0
18	2798	55	Bo	15 (1) v (2) 16	9·6
18	2798	30	Tn	=17	10·0
23	2803	90	Bh	15–2, 16+1	9·7
23	2803	48	Wi	16–1	9·9*b*
25	2805	80	Co	=16, 17+2	9·8
27	2807	22	Bl	11 (6) v (1) 16, =16	9·7*b*
27	2807	30	D	9–4, 16+3	9·5
27	2807	90	Bh	16+1	9·7
28	2808	45	Br	11–3, 16+3	9·5
28	2808	55	Bo	11 (3) v (1) 15	9·4
28	2808	50	Bn	13 (2) v (1) 16	9·6
29	2809	90	Bh	=15, 16+2, 17+4	9·5
May					
1	2811	50	Ma	9 (2) v (1) 16	9·5
3	2813	22	Bl	11 (5) v (2) 16	9·6
5	2815	30	D	9–4, 16+3	9·5
7	2817	45	Bh	=15	9·5
8	2818	50	Bn	9 (1) v (2) 13	9·1
8	2818	48	Wi	=9, =10	9·1
9	2819	90	Bh	5–3, 10+2	8·9
10	2820	55	Bo	7 (1) v (1) 8	8·8
12	2822	22	Bl	5 (3) v (1) 11, =11	9·1*b*
15	2825	90	Bh	9+3, 11+5	8·7
16	2826	30	D	5–3·5, 9+2·5	8·9*b*
19	2829	55	Bg	3 (1) v (4) 6	7·8*b*

1921					
May					
20	2830	30	Bn	3 (5) v (1) 7	8·6
20	2830	22	Bl	3 (6) v (1) 5, =5	8·5*b*
21	2831	45	Bh	5–1	8·7
23	2833	,,	,,	5+1	8·5
24	2834	30	Bn	5 (1) v (3) 6	8·6
27	2837	22	Bl	5 (1) v (5) 11, =5	8·6*b*
28	2838	30	D	4–3, 5+2	8·3
31	2841	,,	,,	4–0·5, 5+5	8·0
June					
1	2842	55	Bo	3–1	7·7
2	2843	45	Bh	=5, =6	8·6*b*
5	2846	30	D	3–3, 4+1	7·9*b*
6	2847	45	Br	5+1	8·5
6	2847	30	Bn	3 (3) v (2) 5	8·2
10	2851	45	Bh	5+3, 6+3	8·3
11	2852	30	Bn	3+2	7·4
11	2852	22	Bl	3 (1·5) (4·5) 5	7·9
14	2855	55	Bo	3+2	7·4
16	2857	30	D	2 (5) v (1) 3, 3+2	7·4*b*
17	2858	,,	Bn	3+3	7·3
18	2859	45	Bh	=3	7·6
23	2864	30	Bn	3+3	7·3
24	2865	45	Bh	3+3	7·3
24	2865	22	Bl	N (1·5) v (2·5) P	6·7
24	2865	30	D	2 (4) v (1) 3, 3+2	7·4
27	2868	45	Bh	2–9, 3+3	7·3
28	2869	30	Bn	3+3	7·3
28	2869	22	Bl	N (1) v (3) P	6·7
28	2869	30	D	2 (4) v (1) 3, 3+3	7·4
July					
3	2874	45	Bh	3+4	7·2
4	2875	30	D	3+2	7·4
5	2876	,,	Bn	3+3	7·3
8	2879	,,	D	2 (3) v (1) 3, 3+4	7·3
8	2879	22	Bl	N (1·5) v (2·5) P	6·7
9	2880	F	Wi	2–6, 3+6	7·0
9	2880	25	Bn	3+2·5	7·4
11	2882	45	Bh	2–8, 3+5	7·1
12	2883	30	Bn	3+3	7·3
13	2884	,,	D	2 (3) v (1) 3, 3+4	7·3
18	2889	45	Bh	2–9, 3+4	7·2
20	2891	30	Bn	3+3	7·3
25	2896	,,	,,	3+3	7·3
25	2896	,,	D	2 (4) v (1) 3, 3+3	7·4*b*
25	2896	F	Wi	2–6, 3+6	7·0
26	2897	45	Bh	3+5	7·1
29	2900	,,	,,	3+5	7·1
30	2901	22	Bl	P (1) v (2) 3, =P	7·3*b*
31	2902	30	D	2 (3) v (1) 3, 3+4	7·3
31	2902	F	Wi	2–8, 3+5	7·1
Aug					
1	2903	80	Co	3+2	7·4
3	2905	,,	,,	3+2	7·4
6	2908	,,	,,	3+1	7·5*b*
6	2908	45	Bh	2–9, 3+3	7·3
8	2910	30	Bn	3+3	7·3
8	2910	80	Co	=3	7·6
9	2911	55	Bo	2 (9) v (1) 3	7·5
14	2916	45	Bh	3+2	7·4
14	2916	80	Co	=3	7·6
18	2920	,,	,,	=3	7·6
19	2921	45	Bh	3+1	7·5

May 27, Uncertain.
Aug. 1, 3, 8, 18, Co, Yellow.
Aug. 14, Co, Rich yellow.

(5194) V BOÖTIS—*continued.*

1921 Aug.					
21	2923	80	Co	3−1	7·7
21	2923	30	D	3−1, 4+3	7·7*b*
22	2924	,,	Tn	=3	7·6
23	2925	55	Bo	3+1	7·5
24	2926	30	D	3−2, 4+3	7·8*b*
24	2926	22	Bl	3 (4) v (2) 5, 3 (3·5) v (2·5) 5	8·2
25	2927	45	Bh	3+1	7·5
25	2927	30	Bn	3+2	7·4*b*
25	2927	80	Co	3−2	7·8
28	2930	,,	,,	3−4, =4	8·0
29	2931	,,	,,	3−2, 4+1	7·9
30	2932	45	Bh	3−1	7·7
30	2932	,,	Br	3−3, 5+6	7·9
30	2932	55	Bo	3 (1) v (4) 4	7·7
Sept.					
2	2935	30	Bn	3 (3) v (2) 5	8·2
2	2935	80	Co	3−4, 4−0·5	8·0
3	2936	,,	,,	4−1·5, 5+2	8·2
4	2937	55	Bo	3 (1) v (1) 4	7·8
4	2937	30	D	4−2, 5+4	8·2*b*
5	2938	80	Co	4−3, 5+1	8·3
5	2938	22	Bl	3 (4·5) v (1·5) 5	8·3
5	2938	45	Bh	3−2	7·8
6	2939	48	Wi	3−8, 5+1	8·4*b*
6	2939	30	Bn	5+1·5	8·4
7	2940	80	Co	3−3, 4−1	8·0
8	2941	48	Wi	5−3, 12+4	8·9
8	2941	30	Bn	5+1	8·5
9	2942	80	Co	3−3, =4	8·0
10	2943	22	Bl	=5	8·6
12	2945	80	Co	4−3, 5+1	8·4
14	2947	,,	,,	4−2·5	8·2
15	2948	30	Bn	5−1	8·7
16	2949	80	Co	=5, =6	8·6
16	2949	45	Bh	3−4, 5+6	8·0
18	2951	30	Tn	6+5	8·1
21	2954	45	Bh	3−5, 5+4	8·1
22	2955	50	Bn	5 (2) v (1) 7	8·7
23	2956	55	Bo	6 (1) v (3) 7	8·6
23	2956	30	D	5−5, 7−3, 11+2	9·0
24	2957	45	Br	5−3, 9+3	8·8
24	2957	90	Bh	5+3, 6+3, 11+10	8·2
24	2957	22	Bl	5 (3) v (3) 11	8·9
25	2958	50	Ma	=11	9·2
27	2960	25	Bn	5 (3) v (1) 7	8·7
27	2960	55	Bo	6 (1) v (1) 7	8·7
Oct.					
1	2964	30	Tn	8 (5) v (5) 11	9·0*b*
1	2964	22	Bl	=11	9·2
1	2964	80	Co	=8, 9+2	8·9
3	2966	55	Bo	8 (1) v (1) 9	9·0*b*
4	2967	80	Co	=9	9·1*b*
4	2967	50	Bn	5 (4) v (1) 7	8·7
5	2968	90	Bh	11+3	8·9
6	2969	80	Co	=9, 11+1	9·1
7	2970	55	Bo	7 (4) v (1) 8	8·8
10	2973	80	Co	=11	9·2
13	2976	,,	,,	11−1·5	9·3*c*
16	2979	50	Bn	11+1	9·1

Aug. 21, Co, Orange.
Aug. 30, Bh, Yellow.
Sept. 4, D, Difficult.
Sept. 7, Scarlet.
Sept. 16, Co, Ruddy.
Sept. 25, About.

1921 Oct.					
17	2980	55	Bo	11 (2) v (3) 15	9·3*b*
17	2980	90	Bh	=11	9·2
17	2980	22	Bl	11 (2) v (5) 16	9·3
19	2982	30	Tn	11−2	9·4
23	2986	,,	,,	11−3	9·5
23	2986	90	Bh	15+2	9·3
23	2986	50	Bn	11−1	9·3
30	2993	,,	,,	13 (2) v (1) 16	9·6
Nov.					
6	3000	90	Bh	11−3, =15	9·5
6	3000	30	Tn	11 (8) v (2) 16	9·7
7	3001	45	Br	11−4, 16+2	9·6
8	3002	50	Bn	16 (1) v (1) 17	9·9*b*
9	3003	22	Bl	16−2, =17	10·0
10	3004	50	Bn	18+1	10·1
21	3015	90	Bh	=18	10·2
24	3018	,,	,,	18−1, 20+2	10·3
25	3019	,,	,,	18−2, 20+2	10·4
Dec.					
4	3028	,,	,,	18−1, 20+3	10·3*b*
15	3039	,,	,,	=17, 18+2	10·0
17	3041	94	Bl	16 (2) v (2) 17	9·9
25	3049	90	Bh	15−3, =16, 18+4	9·8
26	3050	,,	,,	16−1, 17+1	9·9
28	3052	80	Co	16−2, =17	10·0
30	3054	90	Bh	16−1, 17+1	9·9
1922 Jan.					
1	3056	,,	,,	16−3	10·1
3	3058	30	Bn	13 (2) v (1) 16	9·6
4	3059	,,	D	16−4, 19+3	10·1
6	3061	22	Bl	9 (1·5) v (4·5) 16	9·2*b*
10	3065	45	Bh	16−4, 18+1	10·1
18	3073	90	,,	=15	9·5*b*
20	3075	,,	,,	=10, 11+2	9·0
23	3078	22	Bl	11 (2·5) v (3·5) 16	9·4
Feb.					
1	3087	,,	,,	5 (2·5) v (1·5) 11	8·9*b*
2	3088	45	Bh	=5, =6	8·6
4	3090	30	D	5−2, 11+3	8·8
5	3091	55	Bo	5 (1) v (1) 7	8·7
5	3091	45	Bh	3−7, 5+2	8·3
9	3095	80	Co	4−3, 6+2	8·3*b*
11	3097	,,	,,	4−1	8·1
12	3098	45	Bh	5+4	8·2
17	3103	,,	Br	5+2	8·4
17	3103	30	Bn	3 (2) v (1) 5	8·2
17	3103	45	Bh	3−3, 5+6	7·9
18	3104	23	Bo	3 (3) v (1) 4	7·9
18	3104	80	Co	=3	7·6
19	3105	53	Wi	5+2	8·4
20	3106	30	D	3−3, 4+1	7·9*b*
20	3106	80	Co	=3, 4+2	7·7
20	3106	45	Bh	3−3, 5+6	7·9
21	3107	22	Bl	3 (2·5) v (1·5) 5	8·2
24	3110	80	Co	=3. 4+3	7·7*b*
25	3111	23	Bo	3 (1) v (3) 4	7·7
25	3111	30	D	3−3, 4+3	7·8
26	3112	,,	Bn	3 (1) v (2) 5	7·9
26	3112	45	Bh	3−1	7·7
26	3112	27	Li	2 (8) v (2) 3	7·4
27	3113	80	Co	3−1, 4+2	7·8*b*
Mar.					
2	3116	55	Bo	3−1	7·7
4	3118	30	Bn	3+0·5	7·6

Feb. 11, Yellow.

(5194) V BOÖTIS—*continued.*

1922					
Mar					
4	3118	45	Bh	3+2	7·4
4	3118	80	Co	3−1·5, 4+2	7·8
7	3121	30	Bn	3+1·5	7·5
7	3121	45	Br	3+1	7·5*b*
8	3122	55	Bo	3+2	7·4
8	3122	80	Co	3+2·5	7·4
9	3123	53	Wi	3−1	7·7
9	3123	22	Bl	N (1) v (3) P, =N	6·6
10	3124	45	Bh	2 (2) v (1) 3, 3+4	7·2
10	3124	80	Co	3+2	7·4
12	3126	,,	,,	3+2·5	7·4
14	3128	,,	,,	3+2	7·4
15	3129	45	Bh	2 (2) v (1) 3, 3+4	7·2
17	3131	22	Bl	N (1·5) v (2·5) P	6·7
17	3131	30	D	2 (6) v (1) 3, 3+1·5	7·5*b*
18	3132	55	Bo	3+3	7·3*b*
19	3133	45	Bh	3+4	7·2
20	3134	80	Co	3+3	7·3
22	3136	45	Bh	3+5	7·1
23	3137	80	Co	3+5	7·1
23	3137	F	Bo	3+3	7·3
25	3139	45	Br	3+3	7·3
25	3139	30	Bn	3+3	7·3
28	3142	25	,,	3+3	7·3
28	3142	45	Bh	3+5	7·1
31	3145	80	Co	3+3	7·3
31	3145	45	Bh	3+3	7·3
Apr					
1	3146	30	Bn	3+3	7·3
1	3146	80	Co	3+3	7·3
4	3149	45	Bh	3+5	7·1
6	3151	22	Bl	=N	6·5
6	3151	80	Co	3+4	7·2*b*
11	3156	,,	,,	3+4	7·2*b*
14	3159	45	Bh	2 (2) v (1) 3, 3+4	7·2
16	3161	F	Bo	3+4	7·2*b*
17	3162	45	Bh	3+5	7·1
17	3162	80	Co	3+2	7·4*b*
19	3164	,,	,,	=3	7·6*b*
19	3164	33	Wi	3−1	7·7
19	3164	30	Bn	3+2	7·4
19	3164	22	Bl	P (1) v (3) 3, =P	7·2
20	3165	55	Bo	3+5	7·1*b*
20	3165	45	Bh	3+5	7·1*b*
21	3166	33	Wi	=3	7·6*b*
21	3166	80	Co	3+2	7·4
24	3169	,,	,,	=3, 4+3	7·7*b*
24	3169	33	Wi	3−2	7·8
27	3172	80	Co	3+2	7·4
27	3172	30	Bn	3+1	7·5
28	3173	22	Bl	P (2) v (2) 3	7·4
29	3174	45	Br	3+4	7·2
29	3174	,,	Bh	3+2	7·4
May					
2	3177	,,	,,	3+1	7·5
2	3177	80	Co	=3, 4+2·5	7·7
4	3179	F	Bo	3 (1) v (2) 4	7·7*b*
5	3180	...	Kw	3 (1) v (3) 4, 3−1	7·7*c*
5	3180	80	Co	3+1	7·5

Mar. 8, Co, Deep yellow.
Mar. 10, Co, Yellow.
Mar. 12, 14, Rich yellow.
Mar. 20, Golden yellow.
Mar. 23, Co, Yellow.
April 21, Co, Golden yellow.
May 5, Co, Rich yellow.

1922					
May					
5	3180	33	Wi	3−2	7·8
6	3181	,,	,,	5+4	8·2
6	3181	22	Bl	P (3) v (1) 3, =3	7·6
6	3181	45	Bh	=3	7·6
8	3183	...	Kw	=3	7·6
8	3183	80	Co	=3, 4+3	7·7
8	3183	33	Wi	3−4, 5+5	8·0
12	3187	45	Bh	=3	7·6
13	3188	80	Co	3−1, 4+2	7·8
13	3188	30	Bn	3 (3) v (1) 5	8·3
14	3189	55	Bo	3 (2) v (2) 4	7·8
15	3190	80	Co	3−1·5, 4+1	7·8
15	3190	37	Lp	2 (2) v (2) 9	7·7
15	3190	...	Kw	3 (4) v (1) 4	7·9
16	3191	55	Bo	3 (2) v (2) 4	7·8
17	3192	45	Bh	3+2	7·4
17	3192	80	Co	3−2, 4+1	7·9
19	3194	30	Bn	3 (3) v (1) 5	8·3
19	3194	...	Kw	4 (2) v (3) 5	8·2
20	3195	31	D	=6	8·6
20	3195	22	Bl	3 (6) v (2) 5	8·3
21	3196	44	Wi	5+4, 9+10	8·1
21	3196	55	Bo	3 (2) v (2) 4	7·8
21	3196	80	Co	3−3·5, =4	8·0
23	3198	,,	,,	4−1	8·1
26	3201	,,	,,	4−2, 6+2	8·3
26	3201	45	Bh	3−2	7·8
27	3202	,,	,,	3−4	8·0
27	3202	55	Bo	4 (2) v (4) 6	8·2
27	3202	45	Br	3−6, 5+4	8·1
27	3202	30	Bn	5−1, 6+2	8·3
27	3202	80	Co	=6, 7+1	8·0
28	3203	22	Bl	5 (1) v (4) 11, =5	8·0
28	3203	...	Kw	4 (4) v (1) 5	8·4
28	3203	37	Lp	=7	8·1
28	3203	31	D	11+3	8·0
31	3206	45	Bh	3−5, 5+5	8·3
June					
1	3207	30	Bn	6+1, 7+2	8·3
4	3210	45	Bh	3−7, 5+2	8·3
6	3212	25	Bn	7−1	8·0
7	3213	...	Kw	8 (1) v (3) 9	8·0
8	3214	32	Ca	7−1, 8+1	8·1
11	3217	...	Kw	8 (1) v (1) 9	9·0
12	3218	45	Bh	5−2, 10+2	8·0
15	3221	22	Bl	11 (2) v (6) 16	9·2
15	3221	80	Co	11−2	9·2
16	3222	55	Bo	7 (2) v (1) 9	9·0
22	3228	45	Bh	10−1, 11+1	9·2
25	3231	80	Co	=16, 17+1	9·2
26	3232	45	Bh	11−1	9·2
29	3235	,,	,,	11−3	9·2
29	3235	80	Co	18+1	10·1
29	3235	22	Bl	=16	9·2
July					
1	3237	55	Bo	13 (3) v (2) 16	9·2
2	3238	45	Bh	=15	9·2
2	3238	32	Ca	16−1, 17+1	9·2
3	3239	80	Co	18−1	10·1

May 13, 15, Co, Dull yellow.
May 15, Lp, Red.
May 17, Co, Dull orange-yellow.
May 21, Co, Rich yellow.
May 23, Orange.

(5194) V BOÖTIS—*continued.*

1922					
July					
9	3245	32	Ca	18−1, 19+0·5	10·3*b*
10	3246	90	Bh	15−3, 16−1; =17	9·9
11	3247	80	Co	18−0·5	10·3*b*
12	3248	22	Bl	16−0·5	9·8
15	3251	45	Bh	=17	10·0*b*
17	3253	55	Bo	16 (2) v (5) 1	10·0*b*
18	3254	80	Co	18−4	10·6*c*
19	3255	50	Bn	18 (3) v (1) 20	10·5
19	3255	...	Kw	=19	10·4
20	3256	90	Bh	17−1, 18+1	10·1*b*
20	3256	80	Co	18−2·5, =20	10·5
21	3257	45	Br	19+2	10·2
27	3263	,,	Bh	=18	10·2
29	3265	55	Bo	16 (1) v (1) 17	9·9
30	3266	50	Bn	20 (2) v (1) 21	10·7
30	3266	37	Lp	19 (2) v (2) 25	10·9
31	3267	80	Co	20−2	10·8
31	3267	50	Ma	23+2	11·0
Aug					
2	3269	45	Br	=19	10·4*b*
5	3272	,,	Bh	18−1	10·3*b*
11	3278	90	,,	18−2	10·4
15	3282	32	Ca	21 (1) v (1) 22	10·9
15	3282	30	D	19−2	10·6*b*
16	3283	...	Kw	20 (2) v (2) 21	10·7
16	3283	55	Bo	17 (2) v (1) 18	10·1
17	3284	90	Bh	18−2	10·4
17	3284	50	Ma	23 (1) v (1) 25	11·3
17	3284	80	Co	20−2	10·8*b*
20	3287	30	,,	20−3, 21+1	10·8*c*
20	3287	45	Br	19+2	10·2
20	3287	37	Lp	19 (2) v (2) 23	10·8
23	3290	100	,,	19 (3) v (2) 23	10·8
23	3290	30	Co	20−3	10·9*c*
23	3290	75	Bn	20 (1) v (1) 21	10·7
23	3290	55	Bo	20 (1) v (2) 21	10·6
23	3290	90	Bh	18−3, =20	10·5
23	3290	50	Ma	19−1, 25+2	10·8
25	3292	90	Bh	18−2, 20+1	10·4
29	3296	,,	,,	18−1, 20+2	10·3
31	3298	,,	,,	18−3, 20+1	10·5
Sept					
2	3300	,,	,,	18−1, 20+2	10·3*b*
3	3301	80	Ca	19−2, =20	10·6
7	3305	,,	,,	19−2, =20	10·6
7	3305	90	Bh	18−1, 20+2	10·3
9	3307	37	Lp	16 (3) v (2) 19	10·1*b*
10	3308	90	Bh	=18	10·2
11	3309	30	Co	20−2, 21+2	10·7*b*
13	3311	50	Ma	9 (4) v (1) 16, 17+1	9·7
13	3311	80	Ca	19−2, =20	10·6
15	3313	75	Bn	18 (3) v (2) 20	10·4
15	3313	90	Bh	=18	10·2
15	3313	37	Lp	=16	9·8*b*
15	3313	30	Co	18−4, =20	10·6
18	3316	22	Bl	7 (4) v (2) 21	10·5
20	3318	50	Ma	11 (3) v (2) 25	10·5
20	3318	37	Lp	=16	9·8
20	3318	...	Kw	9 (2) v (2) 19, 16−2, 17+0·5	9·8
20	3318	30	Co	18−1·5, 20+1	10·4*b*
21	3319	90	Bh	15−5, 18+2	10·0

July 11, Difficult.
July 18, About.
Aug. 2, About.
Aug. 15, D, 3-in.

1922					
Sept					
24	3322	37	Lp	11 (2) v (2) 17, =16	9·6*b*
24	3322	30	Co	17−1, =18	10·1
24	3322	50	Bn	18 (1) v (3) 20	10·3
26	3324	90	Bh	=17	10·0
29	3327	...	Kw	11 (2) v (2) 20, =17	9·9*b*
30	3328	90	Bh	=16, 17+1	9·8*b*
Oct					
1	3329	45	Br	=11	9·2
4	3332	90	Bh	15+1, 16+3, 17+5	9·4
6	3334	,,	,,	10−1, 11+1	9·1
6	3334	30	Co	11−3, =14	9·4*b*
6	3334	22	Bl	11 (1·5) v (4·5) 16	9·3
7	3335	37	Lp	9 (2) v (2) 11	9·1
8	3336	80	Ca	=12, =13	9·2
10	3338	30	Co	9−0·5, 11−0·5	9·2
12	3340	,,	,,	9+0·5, 11+0·5	9·1
12	3340	...	Kw	=11, 16+4	9·3
12	3340	37	Lp	8 (2) v (2) 9	9·0*b*
12	3340	90	Bh	10+1, 11+2	9·0
13	3341	50	Bn	7 (2) v (1) 8	8·8
13	3341	30	Co	9+0·5, 11+1	9·0
14	3342	55	Bo	7 (1) v (2) 9	8·9
14	3342	90	Bh	10+2, 11+3	8·9
14	3342	33	Wi	9−1, 10+3	9·0
15	3343	...	Kw	8−1, 9+2	8·9
15	3343	37	Lp	=8	8·9*b*
15	3343	30	Co	9+1·5, 11+1·5	9·0
16	3344	34	Li	5 (8) v (2) 6	8·6
17	3345	...	Kw	9+2, 11−1	9·1*b*
20	3348	90	Bh	5−3	8·9
22	3350	30	Co	=6, =7	8·7
22	3350	31	D	7−1, 8+2, 11+5	8·7
23	3351	50	Bn	5 (3) v (1) 6	8·6
25	3353	22	Bl	5 (1) v (5) 11	8·7
25	3353	45	Bh	5−1	8·7
26	3354	30	Co	4−4, 6+1·5	8·4
28	3356	37	Lp	6 (2) v (2) 7	8·7
30	3358	45	Bh	=5, =6	8·6*b*
Nov					
1	3360	90	,,	5+1, 6+1	8·5
4	3363	45	,,	=5, =6	8·6
4	3363	50	Bn	3 (2) v (1) 5	8·2
8	3367	30	Co	4−1·5	8·1
9	3368	45	Bh	=5, =6	8·6
11	3370	,,	Br	3−3, 5+6	7·9
13	3372	50	Bn	3+1	7·5
14	3373	30	Co	=4	8·0
15	3374	22	Bl	3 (4) v (3) 5	8·2
17	3376	45	Bh	3−6, 5+3	8·2
18	3377	32	Ca	3 (1) v (2) 4	7·8
19	3378	45	Bh	3−3, 5+5	8·0*b*
21	3380	,,	,,	=3	7·6*b*
23	3382	30	Co	4−1	8·1
24	3383	45	Bh	3+1	7·5
29	3388	30	Bn	3+1	7·5
Dec					
6	3395	45	Bh	3+3	7·3
8	3397	30	Co	4+2	7·8
11	3400	45	Bh	3+4	7·2
16	3405	,,	,,	3+4	7·2
20	3409	37	Lp	3 (1) v (2) 4	7·7*b*
20	3409	31	D	=3	7·6*b*
20	3409	30	Bn	3+1·5	7·5
23	3412	45	Bh	3+3	7·3*b*
26	3415	37	Lp	3 (1) v (2) 4	7·7*b*

Oct. 28, Yellow.
Dec. 20, D, About.

(5194) V BOÖTIS—*continued.*

1923 Jan						1923 Apr					
4	3424	45	Bh	3+1	7·5	20	3530	22	Bl	=21	10·8
10	3430	30	Co	3−4, 4+2	7·9	20	3530	75	Bn	20 (1) v (2) 21	10·6
11	3431	45	Bh	3+3	7·3	22	3532	90	Bh	20−1	10·7
14	3434	22	Bl	3 (1) v (5) 5, =3	7·8	26	3536	75	Bn	20 (2) v (1) 21	10·7
14	3434	37	Lp	3 (2) v (1) 4, 3 (2) v (2) 5	8·0*b*	May					
16	3436	30	Co	3−2	7·8	1	3541	90	Bh	20−1	10·7
20	3440	,,	Bn	3 (5) v (2) 5	8·3	3	3543	,,	,,	20−2	10·8
23	3443	31	D	4−2, 5+4	8·2	3	3543	80	Co	21−2	11·0
23	3443	22	Bl	3 (1·5) v (4·5) 5, =3	7·9	4	3544	75	Bn	21−1	10·9
23	3443	37	Lp	3 (2) v (1) 4, 3 (2) v (2) 5	8·0*b*	5	3545	100	Lp	20−2	10·8
						8	3548	90	Bh	20−1	10·7
27	3447	B	Ca	4 (1) v (5) 5	8·1	9	3549	32	Ca	=22, 23+2	11·0
27	3447	45	Bh	=3	7·6	10	3550	22	Bl	17 (4·5) v (1·5) 21	10·6
Feb						11	3551	37	Lp	20 (2) v (2) 21	10·7
4	3455	,,	,,	3−3	7·9	11	3551	80	Co	20−3	10·9
4	3455	30	Co	6+3, 7+4	8·3*b*	12	3552	44	Wi	21+2, 23+3	10·7
5	3456	37	Lp	=5	8·6*b*	15	3555	50	Bn	20 (2) v (1) 21	10·7
6	3457	22	Bl	3 (5) v (1) 5	8·4	16	3556	37	Lp	=20	10·6
8	3459	45	Bh	=5, =6	8·6	17	3557	45	Bh	=20	10·6
11	3462	30	Co	6−1, 7−1	8·8	21	3561	90	,,	18−1, 20+3	10·3
14	3465	32	Ca	=10, =11	9·1	24	3564	22	Bl	17 (1) v (4) 21	10·1
16	3467	30	Co	9+2, 11+1	9·0	25	3565	100	Lp	19 (2) v (2) 20	10·5
17	3468	22	Bl	5 (2·5) v (1·5) 11	8·9	30	3570	90	Bh	=18, 20+3	10·2
21	3472	37	Lp	=9	9·1	June					
21	3472	30	Co	11−1	9·3	2	3573	,,	,,	18−2, 20+2	10·4
23	3474	45	Bh	=11	9·2	4	3575	30	D	16−3, 19+3	10·1
26	3477	22	Bl	=11	9·2	6	3577	22	Bl	16−2, =17	10·0
26	3477	30	Co	11−3, 15+2	9·4*b*	10	3581	30	D	16−1, 19+5	9·9
28	3479	,,	,,	11−4, =15	9·5*b*	11	3582	37	Lp	17 (1) v (2) 19	10·1
28	3479	45	Bh	11−1	9·3	17	3588	,,	,,	16 (1) v (2) 17	9·8
Mar						18	3589	30	D	9−5, 16+1·5	9·6
2	3481	90	,,	11−2	9·4	18	3589	22	Bl	11 (3) v (3) 16	9·5
5	3484	,,	,,	11−2	9·4	19	3590	32	Ca	9 (1) v (1) 11	9·1
6	3485	50	Bn	9 (2) v (1) 13	9·2	21	3592	45	Bh	=11	9·2
6	3485	37	Lp	11 (1) v (2) 16	9·4*b*	22	3593	100	Lp	=11	9·2
7	3486	32	Ca	13 (1) v (1) 14	9·3	23	3594	90	Bh	=9, =10, 11+2	9·1
13	3492	90	Bh	11−4, 15−2, 16+2	9·6	29	3600	30	D	5−4, 9+2	8·9
16	3495	30	Co	17−2, 18+1	10·1	29	3600	50	Ma	9+2	8·9
17	3496	,,	,,	17−3, =18	10·2	30	3601	90	Bh	11+3	8·9
17	3496	90	Bh	=17	10·0	July					
17	3496	50	Bn	=17	10·0	2	3603	37	Lp	=9	9·1
18	3497	32	Ca	18 (1) v (3) 20	10·3	4	3605	30	D	5−4, 9+2	8·9
19	3498	25	Lp	11 (4) v (1) 16	9·7*b*	5	3606	22	Bl	5 (3) v (2) 11	8·9
20	3499	22	Bl	17 (1) v (4) 21	10·1*b*	5	3606	37	Lp	7 (1) v (1) 9	8·9
21	3500	90	Bh	15−5, 18+2	10·0	5	3606	80	Co	6−2, 8+2	8·7
24	3503	30	Co	18−2, 20+3	10·3	5	3606	90	Bh	11+3	8·9
24	3503	22	Bl	17 (5) v (2) 21	10·6	6	3607	50	Bn	5 (2) v (1) 6	8·6
25	3504	90	Bh	=18	10·2	6	3607	30	D	5−1, 9+4	8·7
26	3505	44	Li	16 (4) v (6) 17	9·8	8	3609	90	Bh	5−3, 6−3, 9+2	8·9
26	3505	50	Bn	17 (3) v (1) 18	10·1	8	3609	37	Lp	=7	8·8
Apr						8	3609	32	Ca	5 (4) v (5) 11, 8+3	8·7
1	3511	90	Bh	18−2	10·4	10	3611	22	Bl	5 (1·5) v (4·5) 11	8·7
4	3514	50	Bn	18 (2) v (1) 20	10·4	11	3612	80	Co	6−1, =7	8·7
4	3514	80	Co	=20	10·6*b*	12	3613	37	Lp	=6	8·6
4	3514	22	Bl	17 (5) v (1) 21	10·7	12	3613	30	D	5−1	8·7
6	3516	32	Ca	=19, 20+2	10·4	16	3617	45	Bh	=5, =6	8·6
8	3518	90	Bh	18−3, 20−1	10·6	17	3618	34	Li	=5	8·6
8	3518	37	Lp	16 (2) v (2) 19	10·1*b*	18	3619	32	Ca	5 (1) v (1) 7	8·7
9	3519	75	Bn	18 (5) v (1) 20	10·5	18	3619	37	Lp	3 (4) v (1) 5, =4	8·2
13	3523	90	Bh	18−3, =20	10·5	20	3621	30	D	4−3, 5+1	8·4
13	3523	37	Lp	=19	10·4	20	3621	45	Bh	5−1	8·7
13	3523	44	Li	17 (8) v (2) 19	10·3	20	3621	80	Co	4−2	8·2
14	3524	80	Co	20−3, 21+1	10·8	22	3623	37	Lp	=4	8·0
16	3526	32	Ca	20 (1) v (2) 21	10·6	25	3626	80	Co	3−5, =4	8·1
17	3527	90	Bh	20+1	10·5	25	3626	50	Bn	3 (2) v (1) 5	8·2
19	3529	80	Co	20−4, =21	10·9	26	3627	37	Lp	=4	8·0
19	3529	50	Ma	23+1	11·1	30	3631	45	Bh	5+1	8·5

(5194) V BOÖTIS—*continued.*

1923					
Aug					
1	3633	90	Bh	5+3	8·3
2	3634	80	Co	3−3·5, 4+2	7·9
3	3635	45	Bh	3−3, 5+6	7·9
3	3635	32	Ma	11+7	8·5
4	3636	50	Bn	3 (2) v (1) 5	8·2
7	3639	80	Co	3−3·5, =4	8·0
8	3640	32	Ca	=5	8·6
9	3641	45	Bh	3+1	7·5
11	3643	50	Bn	3 (2) v (1) 5	8·2
11	3643	80	Co	=4	8·0*b*
11	3643	37	Lp	3 (2) v (2) 5, 4+1	8·0*b*
11	3643	30	D	3−3, 4+1	7·9
13	3645	37	Lp	3 (2) v (1) 4	7·9*b*
15	3647	80	Co	3−2·5, =4	7·9
15	3647	45	Bh	=3	7·6
18	3650	,,	,,	=3	7·6
18	3650	25	Bn	3−1	7·7
18	3650	37	Lp	3 (3) v (2) 4	7·8*b*
18	3650	37	Co	3−3, =4	8·0
21	3653	80	Co	3−3, =4	8·0
21	3653	37	Lp	3 (2) v (2) 4, 3 (1) v (2) 6	7·9*b*
22	3654	30	D	3−4, 4+2	7·9
24	3656	25	Bn	3−1	7·7
26	3658	30	Co	3−2, 4+2	7·8
26	3658	37	Lp	3 (2) v (3) 4, 3 (1) v (4) 5	7·8*b*
26	3658	45	Bh	3+2	7·4
30	3662	,,	,,	3−1	7·7
30	3662	25	Bn	3+2	7·4
30	3662	37	Lp	3 (1) v (4) 6, 3−1	7·8*b*
30	3662	30	Co	3−0·5, 4+3	7·6
Sept					
1	3664	,,	D	3−1, 4+3	7·7
2	3665	45	Bh	3−1	7·7
3	3666	37	Lp	=3	7·6*b*
3	3666	30	Co	=3, 4+3	7·7
3	3666	22	Bl	=3	7·6*b*
5	3668	100	Lp	=3	7·6*b*
5	3668	30	Bn	3+1	7·5
6	3669	32	Ca	3 (2) v (2) 4	7·8
6	3669	30	Co	3+2	7·4
7	3670	45	Bh	=3	7·6
8	3671	25	Bn	3+2	7·4
8	3671	45	Br	3−3, 5+6	7·9
8	3671	30	D	=3, 4+3	7·7
9	3672	,,	Co	3+3·5	7·3
11	3674	37	Lp	2 (9) v (1) 3	7·5*b*
12	3675	30	D	3+2	7·4
13	3676	45	Bh	3+1	7·5
13	3676	30	Co	3+1	7·5
15	3678	,,	,,	=3, 4+3	7·7
15	3678	22	Bl	P (2·5) v (1·5) 3	7·5*b*
15	3678	37	Lp	2 (9) v (1) 3	7·5*b*
15	3678	50	Bn	3+2	7·4
16	3679	45	Bh	3+2	7·4
17	3680	30	Co	=3, 4+4	7·6
17	3680	37	Lp	2 (9) v (1) 3	7·5*b*
21	3684	30	Co	=3, 4+3	7·7
21	3684	37	Lp	2 (9) v (1) 3	7·5*b*
21	3684	25	Bn	3+1·5	7·5
22	3685	45	Bh	=3	7·6
25	3688	32	Ca	=3	7·6
26	3689	45	Bh	3−1	7·7

Aug. 22, 3-in. OG.
Sept. 1, 4c.
Sept. 6, 9, 13, Co, Yellow.

1923					
Sept					
28	3691	30	Co	=3, 4+3	7·7
29	3692	25	Bn	3−1	7·7
30	3693	37	Lp	=3	7·6*b*
30	3693	30	Co	=3, 4+3	7·7
30	3693	,,	D	3−1, 4+4	7·7
Oct					
1	3694	45	Bh	=3	7·6
4	3697	25	Bn	3 (1) v (3) 5	7·9
4	3697	37	Lp	3+1	7·5*b*
5	3698	45	Bh	3−1	7·7
7	3700	30	Ry	=3, 4+1, 5+3	7·9
8	3701	,,	Co	3−3, 4+1	7·9*b*
9	3702	45	Bh	3−1	7·7
10	3703	20	Ry	3−1, 4+0·5, 5+3	8·0
13	3706	45	Bh	3−2	7·8
13	3706	37	Lp	3 (1) v (4) 5, 3−1	7·8*b*
14	3707	32	Ca	3 (3) v (6) 5	7·9
14	3707	25	Bn	3 (2) v (3) 5	8·0
14	3707	45	Br	3−3	7·9
19	3712	,,	Bh	3−3, 5+6	7·9
21	3714	20	Ry	3−3, 4−1, 5+2	8·1
22	3715	25	Bn	3 (2) v (1) 5	8·2
22	3715	32	Ca	4 (1) v (5) 5	8·1
23	3716	45	Bh	3−5, 6+4	8·1
24	3717	30	Co	3−4, 4+1	8·0*b*
25	3718	22	Bl	3 (5) v (1) 5	8·4
26	3719	30	Co	4−1, 6+2	8·2
27	3720	32	Ca	4 (2) v (4) 5	8·2
Nov					
3	3727	25	Bn	5+1	8·5
3	3727	37	Lp	=7	8·8*b*
4	3728	30	D	4−4, 5+2	8·4
4	3728	,,	Ry	5−3, =7, 9+6	8·7
7	3731	45	Bh	5+2, 6+2	8·4
7	3731	25	Bn	=5	8·6
10	3734	22	Bl	=5	8·6
10	3734	37	Lp	7 (2) v (2) 9	8·9*b*
11	3735	30	Co	=6	8·6
12	3736	,,	Ry	=7, 9+6, 11+6	8·6
14	3738	25	Bn	5 (3) v (2) 6	8·6
16	3740	90	Bh	9+3, 10+3	8·8
17	3741	100	Lp	8 (2) v (2) 9	9·0*b*
17	3741	30	Co	=8, 9+1·5	8·9
19	3743	90	Bh	=9, =10	9·1
20	3744	30	Ry	7−2·5, 9+2·5, 11+2·5	8·9*b*
22	3746	32	Ca	7 (3) v (1) 11	9·1
29	3753	30	Ry	9−2, 11−2·5, 16+2·5	9·4
30	3754	50	Bn	=11	9·2
Dec					
4	3758	,,	,,	9 (2) v (1) 13	9·2
4	3758	90	Bh	=15	9·5*b*
9	3763	30	Ry	=16, 17+2, 20+4	9·9
11	3765	,,	,,	16−1, =17, 20+3·5	10·0
15	3769	32	Ca	18 (1) v (1) 19	10·3
16	3770	50	Ry	16−2·5, 20+1·5	10·2
18	3772	45	Bh	18−1	10·3
24	3778	50	Ry	18−1, =20, =21	10·6
24	3778	,,	Bn	18 (3) v (1) 20	10·5
24	3778	90	Bh	20+1	10·5
28	3782	45	,,	=20	10·6*b*

Sept. 30, D, 3c.
Oct. 1, Yellow.
Oct. 7, Nov. 4, Ry, t.
Nov. 12, 20, 29, Dec. 9, 11, 16, t.
Dec. 24, Ry, T.

(5194) V BOÖTIS—*continued.*

1924 Jan					
2	3787	100	Lp	=19	10·4
2	3787	50	Ry	23−2	11·4
3	3788	90	Bh	20−1	10·7
5	3790	,,	,,	20−2	10·8
5	3790	30	D	16−5, 19+1	10·3*b*
6	3791	22	Bl	21 (2) v (2) 23	11·0
6	3791	50	Bn	20−2	10·8
7	3792	30	D	=19	10·4*b*
9	3794	50	Ry	23−1	11·3
14	3799	,,	Bn	20−3	10·9
15	3800	22	Bl	21−4, =23	11·2
16	3801	90	Bh	20−2	10·8
23	3808	,,	,,	20−2, 23+4	10·8
26	3811	,,	,,	20−1, 23+6	10·6
27	3812	50	Ry	23+2	11·0*b*
27	3812	100	Lp	=21	10·8*b*
28	3813	22	Bl	=21	10·8*b*
29	3814	32	Ca	21 (4) v (1) 24	11·2
Feb 1	3817	60	D	19−2	10·6
1	3817	100	Lp	=21	10·8
3	3819	37	Lp	21 (1) v (2) 22	10·9
7	3823	50	Ry	=23	11·2
8	3824	30	D	=19	10·4
11	3827	90	Bh	20+1	10·5
14	3830	60	D	16−5, 19+2	10·2
14	3830	22	Bl	17 (5) v (2) 21	10·6
14	3830	100	Lp	=21	10·8*b*
15	3831	32	Ca	20 (2) v (3) 22	10·8
16	3832	50	Bn	20 (1) v (3) 21	10·6
18	3834	45	Bh	17−4, 20+2	10·4
21	3837	90	,,	17−3, 20+3	10·3
23	3839	30	Ry	16−5, 18−1, 20+3·5	10·3
24	3840	90	Bh	17 (1) v (1) 20, =18	10·2
25	3841	32	Ca	18 (1) v (2) 20, =19	10·3
26	3842	90	Bh	17−2, 18+1	10·1
28	3844	30	Co	17−2, =18	10·2
28	3844	94	Bl	=17, 21+6	10·1
28	3844	32	Ca	16 (3) v (1) 18, 17−2	10·1
29	3845	50	Ry	16−1	9·9*b*
Mar 1	3846	45	Bh	15−7, =16, 17+2	9·9
4	3849	,,	,,	15	9·5
4	3849	50	Bn	9 (3) v (1) 11	9·1
4	3849	100	Lp	=16	9·8
4	3849	30	D	9−2, 16+5	9·3
4	3849	,,	Co	=15, 16+2·5	9·5
6	3851	22	Bl	11 (3) v (4) 16	9·4
6	3851	32	Ca	11 (1) v (1) 14, =12	9·3
7	3852	50	Bn	9−1, 11+1, 13+1·5	9·1
7	3852	45	Bh	15+1	9·4
8	3853	100	Lp	=11	9·2
8	3853	64	Kw	11−3, 15+3	9·3
8	3853	30	Co	10−2·5, 11−2	9·3
9	3854	32	Ca	8 (2) v (1) 11, =10, 12+2	9·1
9	3854	30	Ry	=9, =11	9·1
9	3854	90	Bh	11−1	9·3
10	3855	33	Wi	11−2	9·4
10	3855	30	D	5−4, 10+1	9·0

Jan. 2, 27, Feb. 7, Ry, T.
Jan. 9, t.
Feb. 23, t, Half-weight for first and third comparisons.
Feb. 29, T.
Mar. 9, Ry, t.

1924 Mar					
11	3856	33	Wi	=11	9·2
11	3856	64	Kw	9−1, 11+1	9·1
11	3856	30	Co	=10, =11	9·1
11	3856	90	Bh	9−1, 11+1	9·1
11	3856	100	Lp	=11	9·2
12	3857	22	Bl	5 (5) v (1) 11	9·1
13	3858	30	Co	11+3	8·9
13	3858	25	Bn	5 (3) v (1) 7	8·7
14	3859	90	Bh	=9, =10	9·1
16	3861	30	Co	=8, 9+2·5	8·8
18	3863	32	Ca	5 (1) v (1) 7	8·7
19	3864	90	Bh	5 (1) v (1) 9	8·8
20	3865	60	Kw	5+2, 9+5	8·5
22	3867	45	Bh	5+1	8·5
24	3869	30	Co	6+1, 7+2	8·5
24	3869	60	Kw	5−2, 11+4	8·8
24	3869	44	Wi	11+4	8·8
26	3871	32	Ca	3 (3) v (1) 4	7·9
26	3871	45	Bh	6−1	8·7
27	3872	13	Ry	4−2,* 5−1, 6+1	8·4
28	3873	30	Co	4−2	8·2
29	3874	25	Bn	5 (3) v (1) 7	8·7
29	3874	37	Lp	5−1	8·7
29	3874	50	Ma	11+5	8·7
29	3874	45	Bh	5+1, 6+1	8·5
29	3874	22	Bl	3 (5) v (1) 5	8·4
30	3875	30	Co	4−4	8·4
30	3875	,,	D	4−4, 5+2	8·4
30	3875	60	Kw	5+1, 9+6, 11+7	8·8
31	3876	10	Wi	3−7, 5+3	8·3
Apr 1	3877	60	Kw	=5, 9+5	8·6
1	3877	30	Co	4−3	8·3
1	3877	F	Lp	4 (2) v (2) 6	8·3
1	3877	25	Bn	5 (3) v (2) 7	8·6
2	3878	45	Bh	5+1, 6+1	8·5
4	3880	25	Bn	5 (1) v (3) 7	8·6
4	3880	30	Co	4−2	8·3
4	3880	,,	D	4−4, 5+2	8·4
4	3880	32	Ca	4 (1) v (5) 5	8·4
5	3881	50	Ma	9+5, 11+4	8·8
5	3881	10	Wi	5+3	8·3
6	3882	45	Bh	5+2, 6+2	8·5
6	3882	60	Kw	5+2, 9+5	8·5
7	3883	,,	,,	=5, 9+5	8·6
7	3883	22	Bl	5 (1) v (4) 11	8·6
7	3883	30	Co	4 (2) v (2) 6	8·4
7	3883	37	Lp	=5	8·4
7	3883	25	Bn	5 (1) v (4) 7	8·4
7	3883	10	Wi	4−1, 5+5	8·4
9	3885	,,	,,	4+1, 5+5	8·4
9	3885	50	Ma	9+4, 11+3	8·8
9	3885	32	Ca	3 (3) v (1) 4	7·9
9	3885	20	Ry	4−3, =5	8·4
10	3886	30	D	4−3, 5+3	8·4
11	3887	45	Bh	5+2, 6+2	8·4
12	3888	32	Ca	3 (2) v (1) 4	7·9
14	3890	45	Bh	5+3, 6+3	8·4
14	3890	30	Co	4−2·5	8·4
14	3890	22	Bl	3 (5) v (1) 5, =5	8·4
15	3891	37	Lp	4 (2) v (2) 5	8·4
20	3896	,,	,,	4 (1) v (2) 5	8·4
20	3896	30	Co	4−1	8·4

Mar. 20, 24, 30, April 1, Kw, T.
April 6, 7, Kw, T.
April 9, Ma, Very difficult. Ry, t.

(5194) V BOÖTIS—*continued.*

924					
pr					
20	3896	25	Bn	3 (3) v (1) 5	8·3
20	3896	32	Ca	3 (2) v (2) 4	7·8
20	3896	60	Kw	5+1	8·5
20	3896	45	Bh	3−1	7·7*b*
25	3901	,,	,,	3 (1) v (3) 6	7·9
25	3901	30	Co	4−2	8·2
25	3901	,,	D	4−4, 5+3	8·3*b*
27	3903	32	Ca	3 (2) v (2) 4	7·8
27	3903	10	Wi	5+4	8·2
ay					
1	3907	10	Wi	4+2, 5+6	7·9
1	3907	60	Kw	5+1	8·5*b*
1	3907	30	D	4−3, 5+3	8·3*b*
1	3907	25	Bn	3 (7) v (2) 5	8·3
3	3909	45	Bh	=3	7·6
4	3910	30	D	4−2, 5+4	8·2
5	3911	50	Ma	9+6, 11+7	8·5
5	3911	30	Co	4−2	8·2
5	3911	10	Wi	4+1, 5+4	8·0
6	3912	32	Ca	3 (2) v (1) 4	7·9
6	3912	45	Bh	=3	7·6
7	3913	25	Bn	3 (2) v (1) 5	8·2
7	3913	22	Bl	3 (5) v (1) 5	8·4
7	3913	30	D	4−2, 5+3	8·2
9	3915	,,	,,	4−2, 5+4	8·2
11	3917	32	Ca	3 (2) v (2) 4	7·8
13	3919	30	Co	4−1	8·1
13	3919	,,	D	4−2, 5+4	8·2
13	3919	22	Bl	3 (5) v (2) 5	8·3
16	3922	45	Bh	3 (1) v (2) 6	7·9
16	3922	32	Ca	3 (3) v (1) 4	7·9
16	3922	25	Bn	3 (1) v (2) 5	7·9
20	3926	60	Kw	5+2	8·4
20	3926	37	Lp	4 (1) v (2) 5	8·2*b*
21	3927	30	D	4−1, 5+4	8·1
22	3928	45	Bh	=3	7·6
23	3929	30	D	4−2, 5+2	8·3
23	3929	32	Ca	3 (2) v (2) 4	7·8
24	3930	22	Bl	3 (5) v (2) 5	8·3
26	3932	30	D	4−2, 5+2	8·3
27	3933	45	Bh	3−1	7·7
27	3933	37	Lp	4 (2) v (2) 5	8·3
27	3933	25	Bn	3 (1) v (3) 5	7·9
28	3934	30	Co	3−3, =4	8·0
29	3935	32	Ca	3 (2) v (2) 4	7·8
30	3936	30	D	4−3, 5+3	8·3
31	3937	45	Bh	=3	7·6
une					
1	3938	30	D	4−2, 5+3	8·2
3	3940	22	Bl	3 (4) v (2) 5	8·2
4	3941	45	Bh	=3	7·6
5	3942	30	Co	3−3·5, =4	8·0
5	3942	,,	D	4−3, 5+3	8·3
8	3945	32	Ca	4 (1) v (5) 5	8·1
9	3946	30	D	4−2, 5+3	8·2
11	3948	45	Bh	3−2	7·8
14	3951	,,	,,	3 (1) v (2) 5	7·9
14	3951	25	Bn	3 (1) v (5) 5	7·8
14	3951	30	Co	3−2, 4+2	7·8
16	3953	22	Bl	=3	7·6
18	3955	45	Bh	3−4, 5+5	8·0

April 20, May 1, Kw, T.
May 20, Kw, T.
May 26, 5^{c}·5.
May 30, June 1, 5^{c}.

1924					
June					
19	3956	37	Lp	=4	8·0*b*
20	3957	25	Bn	3 (1) v (3) 5	7·9
21	3958	30	Co	3−2, 4+1	7·9
21	3958	,,	D	3−3, 4+2	7·9
23	3960	,,	,,	3−3, 4+3	7·8
23	3960	37	Lp	=4	8·0*b*
24	3961	45	Bh	=5, =6	8·6*b*
26	3963	32	Ca	4 (1) v (5) 5	8·1*b*
26	3963	30	D	2 (5) v (1) 3, 3+2	7·4
28	3965	45	Bh	3 (2) v (1) 5	8·2*b*
29	3966	22	Bl	3 (1) v (5) 5	7·8
30	3967	30	D	2 (5) v (1) 3, 3+2	7·4*b*
30	3967	,,	Co	3−2, 4+2	7·8
30	3967	45	Bh	3 (2) v (1) 5	8·2
30	3967	37	Lp	4 (2) v (2) 5	8·3*b*
July					
4	3971	32	Ca	3 (3) v (1) 4	7·9
5	3972	30	D	=3	7·6*b*
6	3973	,,	,,	3+1	7·5
6	3973	22	Bl	3−0·5	7·7*b*
9	3976	45	Bh	3 (1) v (1) 5	8·1
9	3976	30	Co	=3	7·6
9	3976	,,	D	3−1, 4+4	7·7
10	3977	32	Ca	3 (2) v (2) 4	7·8
10	3977	25	Bn	3 (2) v (1) 5	8·2
11	3978	30	D	3−2, 4+3	7·8
12	3979	22	Bl	=3	7·6
12	3979	37	Lp	4 (1) v (2) 5	8·2*b*
14	3981	45	Bh	3 (2) v (1) 6	8·2
16	3983	30	Co	3−2, 4+1	7·9
19	3986	,,	,,	3−2, 4+1	7·9
19	3986	50	Ma	9+6·5	8·4*b*
19	3986	37	Lp	4 (2) v (2) 5	8·3*b*
19	3986	25	Bn	3 (1) v (2) 5	7·9
22	3989	30	Co	3−4, 4−0·5	8·0
24	3991	45	Bh	10+3	8·8
24	3991	37	Lp	4 (2) v (2) 5	8·3*b*
24	3991	25	Bn	5+1	8·5
26	3993	22	Bl	=5	8·6
29	3996	30	Co	3−4·5, 4−1	8·1
29	3996	45	Bh	9+2	8·9
29	3996	25	Bn	5 (1) v (3) 7	8·6
29	3996	50	Ma	9+3, 11+4	8·8
30	3997	32	Ca	5 (1) v (1) 7	8·7
31	3998	30	D	4−2, 5+5	8·1*b*
31	3998	45	Bh	=9, =10	9·1*b*
Aug					
2	4000	,,	,,	5 (2) v (1) 9	8·9*b*
2	4000	30	Co	4−3, 6+0·5	8·4
2	4000	25	Bn	5 (3) v (1) 7	8·7
5	4003	,,	,,	5 (3) v (1) 7	8·7
5	4003	37	Lp	5 (2) v (2) 9	8·8*b*
5	4003	90	Bh	5 (2) v (1) 9	8·9*b*
7	4005	50	Ma	9+3, 11+2·5	8·8*b*
8	4006	90	Bh	5 (1) v (1) 9	8·8
9	4007	22	Bl	5 (4) v (1) 11	9·1
9	4007	30	D	5−2, 9+4	8·7
11	4009	90	Bh	5 (2) v (1) 9	8·9*b*
15	4013	45	,,	5 (2) v (1) 11, =9, =10	9·0
17	4015	30	D	5−4, 9+1	9·0
17	4015	,,	Co	=9, =11	9·1
18	4016	32	Ca	7 (1) v (3) 11	8·9
18	4016	50	Ma	9+2, 11+2, 16+3	9·1

June 26, July 6, D, 5^{c}.
Aug. 7, Difficult.

(5194) V BOÖTIS—*continued.*

Date.	Julian Date.	Inst.	Observer.	Comparisons.	Deduced Mag.
1924 Aug					
18	4016	37	Lp	9 (2) v (2) 11	9·1*b*
19	4017	25	Bn	7 (2) v (1) 8	8·8
19	4017	90	Bh	9 (1) v (1) 11	9·1
22	4020	,,	,,	9 (1) v (1) 11	9·1*b*
25	4023	30	Bn	9 (3) v (2) 13, 11−2	9·2
27	4025	90	Bh	=11	9·2
31	4029	37	Lp	16+1	9·7
Sept					
2	4031	90	Bh	=15, 16+2, 18+5	9·6*b*
5	4034	,,	,,	15−2, =16, 18+4	9·8
6	4035	22	Bl	16 (2) v (2) 21	10·3
8	4037	50	Bn	18 (2) v (1) 20	10·4
8	4037	100	Lp	=19	10·4*b*
8	4037	30	Co	17−1	10·1*b*
9	4038	50	Ma	16 (1) v (3) 25, 16−2	10·2
9	4038	90	Bh	=17	10·0
10	4039	40	D	16−5, 17+2	10·0
16	4045	90	Bh	17 (1) v (1) 18	10·1
18	4047	32	Ca	20 (2) v (1) 21	10·7
23	4052	37	Lp	20 (2) v (2) 21	10·7
23	4052	90	Bh	18−1, 20+2	10·3
24	4053	50	Bn	21−1	10·9
26	4055	90	Bh	20+1	10·5
27	4056	50	Bn	20 (4) v (1) 21	10·8
28	4057	100	Lp	21 (1) v (2) 22	10·9*b*
Oct					
1	4060	90	Bh	=20	10·6
6	4065	,,	,,	20−2	10·8
7	4066	32	Ca	<20	<10·6
13	4072	,,	,,	<20	<10·6
13	4072	90	Bh	20−2	10·8
15	4074	,,	,,	20−3	10·9
19	4078	50	Bn	20 (3) v (1) 21	10·8
20	4079	45	Br	23+2	11·0
23	4082	40	D	19−5, 23+3	10·9
23	4082	32	Ca	=23	11·2
1924 Oct					
23	4082	50	Ry	21−2, 25+1	11·
23	4082	90	Bh	20−2	10·
25	4084	,,	,,	20−2	10·
31	4090	45	,,	20−1	10·
31	4090	30	Ry	20−4, 21+1, 23+4	10·
Nov					
3	4093	50	Bn	18 (4) v (1) 20	10·
3	4093	90	Bh	=20	10·
4	4094	44	Li	20 (5) v (5) 23	10·
5	4095	90	Bh	=20	10·
8	4098	,,	,,	18 (1) v (1) 20	10·
10	4100	,,	,,	17 (2) v (1) 20, 18 (1) v (1) 20	10·
13	4103	30	Ry	16−3, 17−3, 20+2·5	10·
15	4105	90	Bh	=18	10·
17	4107	34	Li	18 (5) v (5) 20	10·
21	4111	50	Ry	16−1, 17−1, 18+2	10·
24	4114	90	Bh	=17	10·
29	4119	32	Ca	11 (1) v (1) 12, =12	9·
Dec					
1	4121	90	Bh	11−2	9·
4	4124	,,	,,	10+1, 11+3	8·
4	4124	20	Ry	10−1, =11	9·
6	4126	30	D	5−4, 9+2, 11+1	9·
9	4129	34	Li	4 (8) v (2) 6	8·
13	4133	90	Bh	5 (1) v (1) 10	8·
19	4139	45	,,	5 (1) v (2) 10	8·
20	4140	32	Ca	4 (4) v (2) 5	8·
22	4142	30	D	4−4, 5+2	8·
24	4144	45	Bh	3 (3) v (1) 5	8·
24	4144	50	Bn	3 (4) v (1) 5	8·
28	4148	,,	,,	3 (3) v (1) 5	8·
28	4148	45	Bh	3 (1) v (2) 5	7·
28	4148	20	Ry	4−0·5, 5+2	8·
30	4150	30	D	4−3, 5+3	8·
31	4151	45	Bh	=3	7·

Oct. 7, Glimpsed.
Oct. 13, Ca, Invisible.

Oct. 23, Ry, t.
Oct. 31, Nov. 13, 21, Ry, T.
Dec. 4, 28, Ry, t.

(5190) R CAMELOPARDALIS. (V. 1.)

H.D. 142584.

Star P = B.D. + 85° 234, estimated by Nijland, 7^{m}·75.

Hagen's 11, which is H.C.O. C (11^{m}·02), has been assigned the value 10^{m}·93, as this was the figure, obtained by grades, given on the list issued to observers.

Date.	Julian Date.	Inst.	Observer.	Comparisons.	Deduced Mag.
1919 Apr					
6	2055	25	AB	7−4, f+2	10·2*b*
May					
5	2084	,,	,,	4−3, 7+4	9·4
8	2087	,,	,,	B−7·5, 4+1	9·2*b*
10	2089	,,	,,	1−5, 4+3	8·8
1919 May					
13	2092	50	AB	1−4, 4+3	8·
19	2098	25	,,	1−1	8·

May 13, 6-in. mirror.

(5190) R CAMELOPARDALIS—*continued.*

1919						1920				
May						May				
21	2100	25	AB	=1	8·5*c*	15	2460	25	AB	10−1, 11+2	10·8
24	2103	,,	,,	1+1	8·4	22	2467	94	Ni	11 (3) v (4) 14	11·2
28	2107	,,	,,	1+2	8·3	26	2471	25	AB	11−1	11·0*b*
June						June				
1	2111	,,	,,	1+2	8·3	7	2483	80	,,	24+2	12·5*b*
4	2114	,,	,,	=1	8·5	8	2484	94	Ni	=16	11·8
7	2117	,,	,,	1+2	8·3	20	2496	80	AB	<24	<12·7*b*
9	2119	,,	,,	1−1	8·6	July					
14	2124	,,	,,	1−1	8·6	10	2516	,,	,,	<24	<12·7*b*
17	2127	,,	,,	1−2	8·7	14	2520	94	Ni	p−1	13·7
21	2131	,,	,,	1−3, 4+4	8·7	19	2525	,,	,,	p−2	13·8*b*
						27	2533	140	Mn	<11	<10·9
July						Aug					
16	2156	,,	,,	4−4, 7+3	9·5	1	2538	,,	,,	<18	<11·8
19	2159	,,	,,	4−5, 7+3	9·5	7	2544	80	AB	<24	<12·7
26	2166	,,	,,	7+1	9·7*b*	13	2550	135	Mn	21 (1) v (1) 24	12·5*b*
31	2171	,,	,,	7−1	9·9	22	2559	60	,,	15 (1) v (1) 16	11·8*b*
Sept						Sept					
2	2224	80	,,	24+2	12·5	4	2572	,,	,,	=10	10·8*b*
5	2227	,,	,,	=24	12·7*b*	5	2573	25	AB	11−2	11·1
Oct						6	2574	94	Ni	7 (7) v (1) 8	10·2
7	2249	,,	,,	...	<12·6	8	2576	25	AB	11−2	11·1
Nov						10	2578	94	Ni	7 (4) v (2) 8	10·1
7	2290	,,	,,	<24	<12·7	10	2578	75	Gi	4−8, 10+2	10·2*b*
Dec						11	2579	60	Mn	7 (6) v (4) 10	10·4*b*
4	2307	,,	,,	=10, 11+2	10·8	14	2582	80	AB	7−4, f−2, 11+4	10·4
10	2313	,,	,,	7−3	10·1*b*	19	2587	,,	,,	7−3·5, =f	10·2
14	2317	,,	,,	=7	9·8	19	2587	32	Mn	7 (4) v (5) 8	10·0
1920						20	2588	22	Ni	7 (3·5) v (4) 8	10·0
Jan						27	2595	32	Mn	=7	9·8*b*
2	2326	,,	,,	4−3, d+3	9·3*b*	28	2596	75	Gi	7−1	9·9
11	2335	22	Ni	4 (1·5) v (5) 7	9·2	Oct					
17	2341	80	AB	1−4·5, 4+1	8·9	3	2601	80	AB	d−3, =7	9·8
23	2347	22	Ni	1 (7) v (2) 4	8·9	4	2602	,,	,,	d−1, 7+2	9·6
24	2348	80	AB	1−4, 4+2·5	8·8*b*	4	2602	22	Ni	7+1	9·7
29	2353	25	,,	1−5, 4+3	8·8*b*	6	2604	32	Mn	4 (3) v (1) 7	9·6*b*
Feb						10	2608	22	Ni	4 (4) v (3) 7	9·5
1	2356	,,	,,	1−3·5, 4+3	8·8*b*	13	2611	32	Mn	2 (2) v (1) 4	9·0
3	2358	22	Ni	1 (4) v (4) 4	8·7	13	2611	80	AB	4−3, d+3	9·3
5	2360	80	AB	1−1·5, 4+5	8·6	15	2613	,,	,,	4−3, d+3	9·3
7	2362	25	,,	1−3, 4+5	8·6	19	2617	22	Ni	4 (3) v (3) 7	9·4
13	2368	,,	,,	1+2	8·3	20	2618	32	Mn	1 (4) v (1) 4	8·9
14	2369	,,	,,	1+1	8·4	22	2620	80	AB	4−1, d+4	9·1
14	2369	22	Ni	1 (5) v (5) 4	8·7	26	2624	,,	,,	4−2, d+3	9·2*b*
18	2373	94	,,	1+4	8·1	28	2626	,,	,,	4−2, d+3	9·2*b*
18	2373	25	AB	1+1·5	8·3	28	2626	32	Mn	1 (2) v (1) 4	8·8
18	2383	22	Ni	1+2	8·3	28	2626	22	Ni	1 (6) v (1) 4	8·9
19	2384	25	AB	1+3·5	8·1	28	2626	47	Gi	1−6, 4+3·5	8·9*b*
Mar						29	2627	80	AB	=4	9·0
6	2400	,,	,,	1+1·5	8·3	31	2629	25	,,	=4	9·0
10	2404	,,	,,	1+0·5	8·4	Nov					
11	2405	22	Ni	1 (2) v (4) 2	8·8	3	2632	32	Mn	1 (1) v (1) 2	8·7*b*
12	2406	25	AB	1−2, 4+3·5	8·7	3	2632	55	Bo	1 (3) v (1) 2	8·8
16	2410	,,	,,	1−3, 4+3	8·7*b*	4	2633	22	Ni	1 (5·5) v (2) 4	8·9
Apr						4	2633	25	AB	4+2	8·8
6	2421	,,	,,	4−1	9·1	6	2635	,,	,,	4+2	8·8
10	2425	22	Ni	1 (8) v (1) B	8·7	7	2636	23	Bo	1 (1) v (3) 2	8·6
11	2426	25	AB	4−3, 7+3	9·4*b*	10	2639	25	AB	1−4, 4+3	8·8
16	2431	22	Ni	4 (4) v (3) 7	9·5	11	2640	B	Mn	=1	8·5*b*
22	2437	25	AB	7+1	9·7*b*	13	2642	25	AB	1−3, 4+3·5	8·7
May						14	2643	117	Gi	1−1·5	8·6
5	2450	,,	,,	7−5, f+1	10·3*b*	16	2645	55	Bo	1+1	8·4
9	2454	,,	,,	f−2·5, 11+3	10·6	17	2646	94	Ni	1+4	8·1
9	2454	22	Ni	7 (1·5) v (1·5) 8	10·1	18	2647	25	AB	1−1, 4+5	8·5

Oct. 17, Not seen.
Nov. 27, Not seen.
Feb. 18, Ni, With 22, 8·3.

Aug. 1, Believed glimpsed.
Nov. 17, With 22, 8·4.

(5190) R CAMELOPARDALIS—*continued.*

1920 Nov					
20	2649	55	Bo	1+2	8·3
22	2651	25	AB	1−3	8·8
22	2651	32	Mn	1+2	8·3*b*
Dec					
1	2660	55	Bo	1+1	8·4*b*
1	2660	80	AB	1+2	8·3
3	2662	B	Mn	=1	8·3*b*
4	2663	22	Ni	1+1·5	8·3
12	2671	55	Bo	=1	8·5
12	2671	B	Mn	1+1·5	8·3
20	2679	25	AB	1−2, 4+4	8·6
21	2680	32	Mn	=1	8·5*b*
24	2683	117	Gi	=1	8·5
1921 Jan					
1	2691	25	AB	4−1, d+5	9·1
6	2696	,,	,,	4−3, d+3	9·3
9	2699	22	Ni	4 (4) v (2) 7	9·6
13	2703	25	AB	d+1	9·4
14	2704	55	Bo	=4	9·0
16	2706	22	Ni	4 (5) v (1) 7	9·7
16	2706	80	AB	d−1, 7+2	9·6
17	2707	47	Gi	4−3, 7+2	9·5
24	2714	90	Bh	4−8, =8, 10+5	10·1
27	2717	55	Bo	7 (3) v (1) 8	10·2
28	2718	75	Gi	7−5, 10+5	10·3
29	2719	80	AB	7−6, 10+3	10·5
30	2720	90	Bh	10+4	10·4
31	2721	55	Bo	8 (1) v (3) 9	10·4
31	2721	80	AB	10+2	10·6
Feb					
2	2723	32	Mn	7 (7) v (3) 10, 8−1	10·5
2	2723	90	Bh	10+2, 11+3	10·6
3	2724	80	AB	10+1	10·7
5	2726	55	Bo	8 (1) v (3) 9	10·4
10	2731	150	Bh	11−1	11·0
12	2733	80	AB	11−5	11·4*b*
13	2734	75	Gi	10−2·5, 11+1, 13+1	11·0
14	2735	83	Li	11 (5) v (5) 13	11·1
15	2736	80	AB	11−5·5	11·5*b*
16	2737	94	Ni	11 (6) v (3) 16	11·5
17	2738	90	Bh	11−3	11·2
19	2740	160	Bo	13 (1) v (3) 14	11·3
20	2741	90	Bh	10−6, 11−5	11·4
20	2741	,,	Mn	13−2	11·4*b*
24	2745	55	Bo	13 (3) v (1) 14	11·5
26	2747	75	Gi	=14	11·5
26	2747	94	Ni	14 (3) v (1·5) 16	11·7
Mar					
2	2751	90	Bh	10−9, 13−5, 17+1	11·7
2	2751	,,	Mn	16 (2) v (1) 24	12·4*c*
2	2751	160	Bo	=24	12·7*c*
4	2753	80	AB	24+1	12·6*b*
5	2754	160	Bo	18 (3) v (1) 20	12·1*b*
7	2756	,,	,,	20 (1) v (3) 25	12·4
8	2757	96	Gr	=24	12·7
10	2759	160	Bo	24 (3) v (1) 25	12·7
10	2759	90	Bh	19+1	12·1*b*
12	2761	94	Ni	24 (2·5) v (4·5) p	13·0
14	2763	117	Gi	24−1	12·8*b*
15	2764	225	Bo	25−1	12·8
16	2765	90	Bh	19−3, 24+2	12·5
18	2767	,,	Mn	24−2	12·9*c*
18	2767	94	Ni	24 (5) v (1·5) p	13·4

Mar. 2, Mn, Very difficult seeing.
Mar. 18, Mn, Glimpsed for certain only once.

1921 Mar					
24	2773	90	Bh	=24	12·7
29	2778	,,	,,	19−6, 24−2	12·8
29	2778	94	Ni	=p	13·6
30	2779	160	Bo	25−3	13·0
Apr					
2	2782	117	Gi	24−5	13·2
2	2782	96	Gr	<24	<12·7
6	2786	130	Mn	24−5	13·2
7	2787	160	Bo	<25	<12·7
7	2787	90	Bh	24−5	13·2
8	2788	94	Ni	p−3	13·9
12	2792	90	Bh	23−8, 24−5	13·2
12	2792	160	Bo	<25	<12·7
18	2798	,,	,,	<25	<12·7
26	2806	90	Bh	<24	<12·7
28	2808	,,	Mn	24−5	13·2
29	2809	94	Ni	p−5	14·1
30	2810	120	Bh	24−7	13·4
May					
5	2815	117	Gi	<24	<12·7
7	2817	90	Bh	24−5	13·2
9	2819	,,	,,	24−1	12·8
10	2820	160	Bo	24−5	13·2
11	2821	94	Ni	p−1	13·7
15	2825	90	Bh	19−2, 24+2	12·4
20	2830	160	Bo	24−2	12·9
26	2836	94	Ni	24+1	12·6
29	2839	96	Gr	=19	12·2
29	2839	150	Wf	13−1, 19+4	11·6
30	2840	117	Gi	15+3, =16	11·6
June					
1	2842	94	Ni	16 (4) v (5) 24	12·2
1	2842	55	Bo	13 (1) v (1) 14	11·4
2	2843	90	Bh	11−4, 13−2	11·4
4	2845	96	Gr	13−2	11·4
7	2848	62	Wf	10−3, 13+1	11·1
10	2851	96	Gr	10−0·5, 11+0·5	10·9
12	2853	117	Gi	10−1, 11+1	10·9
14	2855	55	Bo	=10	10·8
15	2856	90	Bh	=11	10·9
22	2863	96	Gr	7−5, 10+5	10·5
24	2865	,,	,,	7−2	10·6
24	2865	94	Ni	7 (6) v (3) 8	10·5
24	2865	47	Gi	7−4, 10+4	10·5
24	2865	90	Bh	7−3, 10+7	10·1
24	2865	80	AB	7−3, f+3	10·1
25	2866	62	Wf	7−1, 10+4	10·2
27	2868	90	Bh	=6, =7	9·8
28	2869	96	Gr	=7	9·8
30	2871	,,	,,	7+2	9·6
July					
2	2873	45	Bh	=5, 6+1	9·6
4	2875	96	Gr	7+2	9·6
4	2875	22	Ni	4 (6) v (0·5) 7	9·8
5	2876	47	Gi	7−1	9·9
8	2879	62	Wf	4−4, 7+1	9·6
8	2879	22	Ni	4 (6) v (1·5) 7	9·7
9	2880	96	Gr	4−4, 7+4	9·2

April 2, Gr, Invisible.
April 6, Glimpsed.
April 26, Not seen.
Apr. 28, Very doubtful. Believed glimpsed onc
May 5, Glimpsed.
June 24, Ni, With 22, 10·1.
June 25, 3-in.
June 27, Steely blue.
July 8, 13, 22, Wf, 3-in.

(5190) R CAMELOPARDALIS—*continued.*

1921					
uly					
9	2880	80	AB	4−5, d+1	9·5
11	2882	,,	,,	4−5, d+2	9·4
11	2882	45	Bh	=4	9·0*b*
13	2884	96	Gr	4−2	9.2
13	2884	62	Wf	4−2, 7+3	9·4
15	2886	47	Gi	4−2·5, 7+2	9·4*b*
18	2889	90	Bh	5+3, 6+5	9·3
19	2890	96	Gr	4−1	9·1
22	2893	62	Wf	4−1, 7+4	9·3
22	2893	25	AB	4−5, d+2	9·4
24	2895	96	Gr	4−1	9·1
25	2896	25	AB	4−3, d+3	9·3
26	2897	90	Bh	=2, =3	9·0
27	2898	25	AB	4−3, d+5	9·2
29	2900	,,	,,	4−2	9·2
29	2900	90	Bh	=2	8·9
29	2900	47	Gi	1−5, 4+1·5	8·9
29	2900	96	Gr	4+1	8·9
30	2901	62	Wf	=4	9·0
31	2902	25	AB	4−1	9·1
31	2902	62	Wf	1−4, 4+1	8·9
ug					
1	2903	25	AB	4−1	9·1
2	2904	62	Wf	1−3, 4+1	8·8
4	2906	96	Gr	1−3, 4+3	8·7
4	2906	25	AB	=4	9·0
5	2907	62	Wf	1−2, 4+3	8·7
6	2908	90	Bh	2+3, 3+5	8·6
6	2908	25	AB	1−4, 4+2	8·8
8	2910	47	Gi	1−1, 4+4·5	8·6
8	2910	62	Wf	1−1, 4+4	8·6
9	2911	96	Gr	=1	8·5
9	2911	55	Bo	1 (1) v (3) 2	8·6
10	2912	62	Wf	=1	8·5
13	2915	,,	,,	1+1	8·4
15	2917	45	Bh	2+5	8·4
19	2921	,,	,,	=1, 2+6	8·4
19	2921	96	Gr	1+1	8·4
19	2921	22	Ni	P (6) v (3) 1	8·2
23	2925	55	Bo	a (2) v (1) 1, 1+3	8·2
25	2927	45	Bh	1+2, 2+8	8·2
25	2927	96	Gr	1+2	8·3
25	2927	62	Wf	a−4, 1+1	8·3
26	2928	22	Ni	P (2·5) v (2·5) 1	8·1
28	2930	25	AB	a−2, 1+3	8·1
29	2931	45	Bh	1+2, 2+8	8·2
29	2931	47	Gi	1+4	8·1
29	2931	96	Gr	1+5	8·0
30	2932	55	Bo	a (5) v (2) 1	8·3
30	2932	25	AB	a−2, 1+4	8·1
ept					
1	2934	,,	,,	a−1, 1+4	8·0
4	2937	45	Bh	1+2, 2+8	8·2
4	2937	55	Bo	a (3) v (2) 1	8·2
5	2938	25	AB	a−2, 1+2	8·2*c*
7	2940	,,	,,	a−4, 1+2	8·3*b*
7	2940	22	Ni	P (5) v (2) 1	8·3
10	2943	62	Wf	=1	8·5
10	2943	45	Bh	1+2, 2+8	8·2*b*
14	2947	117	Gi	1+2	8·3
16	2949	45	Bh	=1, 2+5	8·4
1921					
Sept					
16	2949	62	Wf	a−3, 1+1	8·3
21	2954	55	Bo	a (5) v (1) 1	8·4
22	2955	25	AB	1−1, 4+4	8·6*b*
23	2956	22	Ni	=1	8·5
23	2956	62	Wf	1−1, 4+3	8·6
24	2957	25	AB	1−3, 4+3	8·7
26	2959	55	Bo	a (7) v (1) 1	8·4
27	2960	25	AB	1−3, 4+2	8·8
28	2961	45	Bh	1−3, 4+3	8·7
30	2963	47	Gi	1−2, 4+7	8·5*b*
Oct					
1	2964	22	Ni	1 (4) v (2) 4	8·8
1	2964	45	Bh	1−3, 4+3	8·7
1	2964	55	Bo	1 (1) v (4) 2	8·5
1	2964	25	AB	1−4, 4+1	8·9
3	2966	,,	,,	=4	9·0
3	2966	62	Wf	1 (1) v (1) 4	8·7
5	2968	96	Gr	1+2	8·3
5	2968	25	AB	=4	9·0
6	2969	83	Li	1 (5) v (5) 2	8·7
6	2969	55	Bo	1 (3) v (1) 2	8·8
6	2969	90	Bh	=2	8·9
9	2972	45	,,	=2	8·9
9	2972	37	Li	1 (3) v (7) 4	8·6
14	2977	96	Gr	4+3	8·7*b*
15	2978	47	Gi	=4	9·0
15	2978	55	Bo	2 (1) v (1) 4	9·0
16	2979	45	Bh	=2, =3	9·0*b*
18	2981	25	AB	d−3, 7+3	9·7*b*
20	2983	,,	,,	d−1, 7+3	9·6
20	2983	96	Gr	=7	9·8
21	2984	55	Bo	7 (1) v (4) 8	9·9*b*
21	2984	62	Wf	d−7, 7+3	9·9
23	2986	37	Li	7 (5) v (5) 8	10·1
23	2986	90	Bh	2−2, 3+1	9·1
29	2992	55	Bo	7 (4) v (1) 8	10·2
30	2993	96	Gr	10+3	10·5
31	2994	25	AB	7−4, 10+3	10·4
31	2994	45	Bh	4−2	9·2
Nov					
2	2996	22	Ni	7 (4) v (3) 8	10·1*b*
6	3000	55	Bo	7 (2) v (1) 8	10·1*c*
7	3001	80	AB	f−4, 10+2	10·7*b*
11	3005	140	Bo	10 (1) v (1) 11	10·9
12	3006	45	Bh	5−2, 6−1	9·8*b*
17	3011	96	Gr	11+2	10·7
17	3011	140	Bo	11 (1) v (1) 13	11·1
20	3014	80	AB	11−2	11·1
22	3016	55	Bo	13 (3) v (1) 14	11·5
22	3016	90	Bh	10−7, 11−5	11·5*b*
22	3016	94	Ni	8 (7) v (1·5) 11	10·8
24	3018	90	Bh	11−8, 24+10	11·7
25	3019	55	Bo	13 (2) v (1) 14	11·4
26	3020	94	Ni	8 (6) v (2·5) 11	10·7
28	3022	75	Gi	13−1·5, 14+3·5 18+4·5	11·3*b*
30	3024	96	Gr	11−5	11·4
Dec.					
2	3026	94	Ni	8 (4) v (5) 11	10·6
4	3028	90	Bh	24+5	12·2*b*
4	3028	83	Li	13 (3) v (7) 24	11·7
15	3039	150	Wf	19−3, 24+2	12·5*b*
15	3039	90	Bh	24−2	12·9*b*
18	3042	140	Bo	23 (1) v (1) 24	12·6*b*
20	3044	90	Bh	24−1	12·8

July 30, 31, Wf, 3-in.
Aug. 2, 8, 10, 13, 25, Wf, 3-in.
Aug. 5, 6-in.
Sept. 10, 16, 23, Wf, 3-in.

Oct. 3, 21, Wf, 3-in.

(5190) R CAMELOPARDALIS—*continued.*

1921					
Dec					
21	3045	117	Gi	=24	12·7
24	3048	94	Ni	24−0·5	12·7
25	3049	90	Bh	24−4	13·1
26	3050	160	Bo	23 (2) v (1) 24	12·6
29	3053	94	Ni	24 (3) v (3) p	13·1
1922					
Jan					
1	3056	90	Bh	24−5	13·2
3	3058	150	Wf	24−3	13·0
5	3060	...	Gi	24−3	13·0
6	3061	140	Bo	24−1	12·8*c*
16	3071	275	Bo	<24	<12·7
18	3073	150	Wf	24−5	13·2
18	3073	90	Bh	23−8, 24−5	13·2
21	3076	...	Gi	24−6	13·3
30	3085	160	Bo	24−2	12·9*c*
31	3086	150	Wf	24−5	13·2
Feb					
1	3087	160	Bo	24−4	13·1*c*
4	3090	94	Ni	24 (2) v (3) p	13·0
5	3091	275	Bo	24−4	13·1*b*
8	3094	,,	,,	24−2	12·9*c*
14	3100	,,	,,	=24	12·7*b*
17	3103	90	Bh	19+1	12·1
17	3103	...	Sa	10−10, 13−10, 24+3	12·1
18	3104	160	Bo	24−1	12·8*b*
19	3105	62	Wf	13−5, 18+1	11·7
20	3106	...	Gi	14 (2) v (4) 24	11·9
20	3106	70	Gr	=24	12·7
21	3107	83	Li	18 (5) v (5) 24	12·2*b*
25	3111	94	Ni	11 (5) v (3·5) 16	11·4
25	3111	55	Bo	13 (2) v (1) 14	11·4
26	3112	90	Bh	11−4, 13−3	11·5
27	3113	...	Sa	13−6, 18+3	11·7
27	3113	140	Bo	13 (1) v (2) 14	11·3
28	3114	62	Wf	13 (1) v (1) 18	11·5
Mar					
2	3116	55	Bo	13 (1) v (2) 14	11·3
4	3118	90	Bh	10−1, =13	11·1
4	3118	...	Gi	=10	10·8
8	3122	140	Bo	13 (1) v (2) 14	11·3*b*
8	3122	...	Sa	f−3, 10+2, 13+4	10·7
15	3129	62	Wf	7−6, f+0·5, 10+4	10·4*b*
15	3129	90	Bh	11+4	10·5
16	3130	55	Bo	8 (2) v (3) 10	10·5
16	3130	70	Gr	=11	10·9
18	3132	94	Ni	7 (7) v (3) 8	10·2
19	3133	90	Bh	7−2, 11+8	10·1
22	3136	,,	,,	=6, =7	9·8
22	3136	62	Wf	7 (1) v (1) f	10·1*b*
23	3137	55	Bo	5 (2) v (1) 7	9·8
28	3142	90	Bh	5−1, =6	9·7
31	3145	22	Ni	7 (2) v (6) 8	9·9
31	3145	62	Wf	7−1, 8+4	9·9
Apr					
4	3149	90	Bh	4−4, 5+2	9·5
5	3150	...	Sa	1−12, 4−7, d−3, 7+1	9·7
9	3154	90	Bh	4−3	9·3
13	3158	...	Gi	4 (2) v (4) 7	9·3
13	3158	70	Gr	=4	9·0
14	3159	22	Ni	4 (3) v (4) 7	9·4
16	3161	55	Bo	1 (4) v (2) 4	8·8
17	3162	90	Bh	4−1	9·1
18	3163	,,	,,	=4	9·0
19	3164	62	Wf	1−3, 4+2	8·8
20	3165	55	Bo	1 (3) v (3) 4	8·7
29	3174	62	Wf	1−2, 2+3	8·6
29	3174	90	Bh	=4	9·0
May					
2	3177	,,	,,	2+1, 3+4, 4+2	8·8
3	3178	70	Gr	1−5	9·0
4	3179	55	Bo	1 (1) v (3) 2	8·6
6	3181	90	Bh	4+5	8·5
8	3183	...	Gi	1−1·5	8·6
10	3185	70	Gr	1−2	8·7
12	3187	45	Bh	1−1, 4+6	8·5
12	3187	62	Wf	=1	8·5
14	3189	55	Bo	1+1	8·4
16	3191	70	Gr	=1	8·5
19	3194	62	Wf	=1	8·5
19	3194	...	Gi	1+2·5	8·2
19	3194	...	Sa	a−7, 1+1, 4+6, 7+12	8·5
20	3195	55	Bo	1+2	8·3
21	3196	22	Ni	1 (3) v (4) 4	8·7
21	3196	70	Gr	=1	8·5
24	3199	,,	,,	1+2	8·3
27	3202	...	Sa	a−6, 1+4, 4+8	8·2
27	3202	90	Bh	4+5	8·5
27	3202	55	Bo	1+1	8·4
28	3203	22	Ni	1−1	8·6
28	3203	62	Wf	a−4, 1+2·5	8·2
29	3204	...	Gi	1+2·5	8·2
31	3206	50	Gr	1+5	8·0
31	3206	90	Bh	1+2	8·3
June					
4	3210	45	,,	1+1	8·4
4	3210	22	Ni	1+1	8·4
5	3211	70	Gr	1+1	8·4
9	3215	...	Gi	1+2	8·3
10	3216	62	Wf	1+3	8·2
12	3218	45	Bh	1+2	8·3
16	3222	55	Bo	1+2	8·3
16	3222	70	Gr	=1	8·5
17	3223	62	Wf	a−4, 1+1·5	8·3
19	3225	45	Bh	1+1, 4+6	8·4
23	3229	70	Gr	1+1	8·4
23	3229	32	Ca	a−3, 1+3	8·2
23	3229	...	Sa	a−8, 1+2, 4+6	8·4
24	3230	62	Wf	a−5, 1+1·5	8·3
26	3232	90	Bh	=1	8·5
27	3233	70	Gr	1−2	8·7
28	3234	...	Gi	1+1	8·4
29	3235	...	Sa	1+2, 4+7	8·3
July					
1	3237	70	Gr	1−3	8·8
2	3238	45	Bh	=1	8·5
2	3238	62	Wf	=1	8·5
9	3245	70	Gr	1−5	9·0
10	3246	...	Gi	1 (2·5) v (4) 4	8·7
11	3247	...	Sa	1+1, 4+4, d+10	8·5
12	3248	22	Ni	1 (7) v (1·5) 4	8·9
14	3250	90	Bh	1−2, 4+4	8·6
16	3252	70	Gr	1−5	9·0
19	3255	55	Bo	2 (1) v (1) 4	9·0
20	3256	45	Bh	1−3, 4+3	8·7

Mar. 18, With 22, 10·1.
Mar. 31, Wf, Reddish.

May 19, Wf, Orange-red.

(5190) R CAMELOPARDALIS—*continued.*

1922 July					
20	3256	70	Gr	1−7	9·2
23	3259	62	Wf	1−6, 4+1	9·0
25	3261	70	Gr	4−5	9·5
26	3262	...	Gi	1 (3·5) v (1) 4	8·9
27	3263	45	Bh	1−4, 4+2	8·8
30	3266	62	Wf	4−2, =3, 7+6	9·2
30	3266	70	Gr	4−5	9·5
31	3267	55	Bo	4 (3) v (2) 4′	9·3
Aug.					
5	3272	90	Bh	1−10, 4−4	9·4*b*
7	3274	94	Ni	4 (6) v (1) 7	9·7
7	3274	64	Ad	7−2	10·0*b*
9	3276	70	Gr	7−2	10·0
12	3279	90	Bh	4−10, 10+7	10·1
14	3281	62	Wf	7−4, 11+6	10·3
15	3282	64	Ad	=10	10·8
16	3283	55	Bo	8 (2) v (3) 10	10·5
17	3284	70	Gr	7−5	10·3
17	3284	22	Ni	7 (4·5) v (2) 8	10·1
17	3284	45	Bh	10+1, 11+2	10·7*b*
18	3285	90	,,	=11	10·9
18	3285	...	Gi	7 (8) v (2·5) 10	10·6
20	3287	64	Ad	10 (1) v (1) 11	10·9
20	3287	70	Gr	10+3	10·5
21	3288	94	Ni	8 (1) v (4) 11	10·4
21	3288	62	Wf	7−7, 10+1, 11+2	10·7
23	3290	...	Sa	f−10, 10−4, 13−2, 18+10	11·2
23	3290	70	Gr	11+1	10·8*b*
23	3290	55	Bo	10 (1) v (1) 11	10·9
23	3290	64	Ad	10 (1) v (1) 11	10·9*b*
23	3290	90	Bh	11−1	11·0
25	3292	,,	,,	11−1	11·0
25	3292	80	Ca	=11, =12	10·9
27	3294	94	Ni	=11	10·9
27	3294	70	Gr	13+1	11·1
31	3298	90	Bh	11−3, =13	11·2
31	3298	...	Gi	=11	10·9
Sept.					
7	3305	150	Wf	13−3, 14+1	11·5*b*
7	3305	90	Bh	13−4, 19+5	11·7
8	3306	96	Gr	11−7	11·6
9	3307	...	Sa	24+5	12·2
10	3308	94	Ni	11 (1) v (5) 14	11·0
10	3308	90	Bh	13−6, 19+4	11·8
11	3309	64	Ad	=19	12·2*b*
13	3311	62	Wf	13−5, 19+3	11·8
15	3313	90	Bh	19+1, 24+6	12·1
16	3314	96	Gr	=19	12·2
16	3314	150	Wf	18−2, 19+1	12·1
17	3315	94	Ni	=19	12·2
20	3318	96	Gr	=24	12·7
20	3318	...	Gi	18 (1) v (4) 24, =19	12·0
21	3319	90	Bh	19−1, 24+3	12·3
23	3321	150	Wf	19−1, =21	12·3
26	3324	90	Bh	24+1	12·6
29	3327	275	Bo	24−2	12·9*c*
Oct.					
4	3332	90	Bh	<24	<12·7
8	3336	157	Wf	30+2	13·7
12	3340	90	Bh	24−2	12·9
13	3341	94	Ni	24 (6) v (1) p	13·4*b*
13	3341	275	Bo	<24	<12·7
14	3342	90	Bh	24−2	12·9
15	3343	157	Wf	=30	13·9
18	3346	275	Bo	<24	<12·7
20	3348	90	Bh	24−2	12·9
21	3349	94	Ni	p+1·5	13·4
1922 Oct.					
25	3353	90	Bh	24−2	12·9
26	3354	275	Bo	<24	<12·7
27	3355	94	Ni	p+2	13·4
Nov.					
4	3363	90	Bh	=24	12·7
9	3368	,,	,,	24−3	13·0
10	3369	157	Wf	30+3	13·6
14	3373	90	Bh	24−4	13·1
15	3374	94	Ni	=p	13·6
16	3375	140	Bo	19 (4) v (1) 24	12·6*b*
17	3376	...	Gi	24 (5) v (2) 30	13·5
21	3380	90	Bh	24−4	13·1
24	3383	150	Lp	=24	12·7*b*
25	3384	90	Bh	24−3	13·0
26	3385	,,	,,	24+1	12·6
26	3385	94	Ni	19 (1) v (4) 24	12·3
27	3386	275	Bo	19 (2) v (3) 24	12·4*b*
Dec.					
4	3393	90	Bh	24+3	12·4
9	3398	,,	,,	13−5, 19+4	11·8
11	3400	,,	,,	10−4, 11−3, =13	11·2
14	3403	94	Ni	7 (7) v (1·5) 8	10·2
14	3403	55	Bo	11 (1) v (1) 13	11·1
17	3406	90	Bh	11−1, 13+2	11·0
18	3407	,,	,,	10−2, 13+2	11·0
20	3409	100	Lp	7 (2) v (1) 10	10·5
20	3409	55	Bo	7 (4) v (1) f	10·2
23	3412	37	Lp	8−1	10·4
25	3414	90	Bh	10+1, 11+2, 13+5	10·7*b*
26	3415	55	Bo	7 (2) v (3) f	10·0
26	3415	...	Sa	1−20, 4−10, 7−6, 10+12, 13+15	10·0
26	3415	100	Lp	7 (2) v (2) 8	10·1
30	3419	94	Ni	7−1·5	10·0
1923 Jan.					
4	3424	90	Bh	4−2	9·2
6	3426	37	Lp	=7	9·8
8	3428	90	Bh	=4	9·0
9	3429	22	Ni	4 (6) v (2·5) 7	9·6
9	3429	34	Li	=4	9·0
11	3431	90	Bh	4−1	9·1
12	3432	37	Lp	=6	9·7*b*
16	3436	,,	,,	4 (2) v (1) 6	9·5
17	3437	75	Gi	4 (1·5) v (4·5) 7	9·2
20	3440	22	Ni	4 (3·5) v (5) 7	9·4
20	3440	37	Lp	4 (2) v (2) 6	9·4
21	3441	34	Li	2 (5) v (5) 4	9·0
21	3441	...	Sa	1−6, =4, 7+5	9·1
23	3443	62	Wf	1−3, 4+2	8·8
24	3444	45	Bh	1−5, 4+1	8·9*b*
25	3445	...	Sa	a−10, 1−7, 4+2, 7+10	8·9
27	3447	90	Bh	1−3, 4+3	8·7
Feb.					
3	3454	45	,,	1−3, 4+3	8·7
4	3455	37	Lp	1 (2) v (1) 4	8·8*b*
6	3457	...	Sa	1−1, 4+5	8·5
6	3457	94	Ni	1+1·5	8·3
7	3458	62	Wf	1−2, 4+5	8·6
8	3459	37	Lp	1 (2) v (2) 4	8·7*b*
8	3459	90	Bh	1−3, 4+3	8·7

Nov. 4, Glimpsed.
Nov. 24, Difficult.
Dec. 14, Ni, With 22, 10·3.
Dec. 30, With 22, 9·8.
Feb. 6, Ni, With 22, 8·4.

(5190) R CAMELOPARDALIS—*continued.*

1923					
Feb					
16	3467	90	Bh	1−4, 4+2	8·8
16	3467	32	Ca	1 (2) v (2) 2	8·7
17	3468	22	Ni	1+1·5	8·3
21	3472	37	Lp	1 (1) v (2) 4, 1 (2) v (2) 4	8·7*b*
23	3474	90	Bh	=1	8·5
25	3476	,,	,,	1−1	8·6
Mar					
2	3481	,,	,,	1−1	8·6
2	3481	...	Sa	1+2	8·3
4	3483	37	Lp	=1	8·5*b*
5	3484	90	Bh	=1	8·5
7	3486	32	Ca	a (4) v (2) 1	8·3
13	3492	90	Bh	1+2	8·3
15	3494	117	Gi	1+1·5	8·3
17	3496	90	Bh	=1	8·5
17	3496	22	Ni	1 (2) v (4) 4	8·6
19	3498	...	Sa	1−3, 2+2	8·7
19	3498	34	Li	a (8) v (2) 1	8·3
21	3500	,,	,,	a (7) v (2) 1	8·3*b*
21	3500	94	Ni	1+0·5	8·4
21	3500	90	Bh	1+2	8·3
22	3501	32	Ca	1 (1) v (5) 4	8·5
24	3503	34	Li	a (8) v (2) 1	8·3
25	3504	90	Bh	1+2	8·3
29	3508	...	Sa	1−4, 2+2, 4+6	8·7
30	3509	75	Gi	1 (1·5) v (8) 4	8·5
Apr					
1	3511	90	Bh	=1	8·5
2	3512	22	Ni	1 (4) v (3) 4	8·8
6	3516	62	Wf	1−3, 4+3	8·7
8	3518	34	Li	1 (2) v (8) 2	8·5
9	3519	90	Bh	1−1	8·6
10	3520	62	Wf	1−4, 4+2	8·8
10	3520	22	Ni	=4	9·0
12	3522	32	Ca	1 (3) v (3) 4	8·7
13	3523	34	Li	1 (3) v (7) 2	8·6
13	3523	37	Lp	1 (4) v (1) 4	8·9
13	3523	90	Bh	1−3, 4+3	8·7
15	3525	62	Wf	4−2, 7+5	9·3
19	3529	...	Sa	4+1	8·9
20	3530	22	Ni	1 (7) v (0·5) 4	9·0
22	3532	45	Bh	=4	9·0
25	3535	75	Gi	4 (2·5) v (2·5) 7	9·4
28	3538	...	Sa	3−4, 5+2, 7+3	9·5*b*
May					
1	3541	90	Bh	4−4, 7+2	9·5
3	3543	37	Lp	7−2	10·0*b*
3	3543	...	Sa	7−3, 8+3	10·1
6	3546	62	Wf	4−7, 7+2	9·7
8	3548	90	Bh	4−8, 7−2, 10+8	9·9
12	3552	...	Sa	7−7, 10+3, 13+7	10·5
12	3552	34	Li	7 (3) v (7) 8	10·0
16	3556	,,	,,	8 (3) v (7) 9	10·4
16	3556	37	Lp	=9	10·7*b*
16	3556	45	Bh	4−12, 10+4	10·3*b*
18	3558	94	Ni	11−1	11·0
19	3559	117	Gi	10 (1·5) v (1·5) 13	11·0
20	3560	62	Wf	=10, 11+1	10·8
21	3561	80	Ca	=10	10·8
25	3565	94	Li	=11	10·9
25	3565	100	Lp	=13	11·2*b*
30	3570	45	Bh	10−3, 13+1	11·1*b*

Mar. 15, 4c·5.
Mar. 21, Ni, With 22, 8·5.

1923					
June					
2	3573	90	Bh	13−3	
2	3573	...	Gr	=13	
3	3574	62	Wf	11−6, 13−3, 15+3	
4	3575	94	Ni	14 (3) v (2) 16	
11	3582	,,	Li	14 (5) v (5) 16	
11	3582	90	Bh	13−5, 19+3	
13	3584	117	Gi	14 (5·5) v (1·5) 19	
23	3594	90	Bh	19−1	
July					
1	3602	150	Wf	24−1, =25	
2	3603	...	Gr	<24	<1
4	3605	150	Lp	<24	<1
5	3606	90	Bh	24−1	
6	3607	94	Ni	24 (4·5) v (2) p	
8	3609	90	Bh	24−3	
9	3610	117	Gi	24−4	
10	3611	157	Wf	24−7, A+4	
11	3612	94	Ni	24 (5) v (1) p	
15	3616	157	Wf	A+2	
19	3620	...	Sa	<24	<1
20	3621	90	Bh	Estimated	<1
22	3623	157	Wf	A+3	
26	3627	OG	Ph	<24	<1
30	3631	90	Bh	24−5	
Aug					
1	3633	94	Ni	p+0·5	
1	3633	90	Bh	24−4	
3	3635	,,	,,	19−7, 24−2	
4	3636	OG	Ph	24−4	
6	3638	157	Wf	24−4	
9	3641	...	Sa	=24	
9	3641	90	Bh	24−1	
12	3644	150	Wf	24−1, =25	
12	3644	,,	Lp	=24	
15	3647	,,	,,	24+1	
15	3647	...	Sa	22−3, =23, 24+1	
15	3647	90	Bh	24−2	
22	3654	150	,,	19−7, 24−2	
28	3660	...	Sa	11−6, 13−4, =14, 19+8	
29	3661	150	Wf	11−3, =13	
29	3661	...	Gr	=13	
31	3663	100	Lp	=13	
31	3663	90	Bh	11−8, 13−4, 19+4	
Sept					
1	3664	,,	,,	11−7, 13−4	
2	3665	,,	,,	11−5	
3	3666	37	Lp	9 (2) v (1) 10	
3	3666	94	Ni	8−1	
6	3669	OG	Ph	10 (1) v (1) 13, =11	
6	3669	62	Wf	7−6, 11+4	
7	3670	32	Ca	9 (1) v (1) 10, 11+2	
7	3670	...	Sa	8−4, 9+1, 10+2, 11+3	
7	3670	37	Lp	=9	
7	3670	90	Bh	7−10, 10+4	
8	3671	22	Ni	7 (5) v (2) 8	
9	3672	...	Gr	10+5	

July 2, Invisible.
July 4, Not seen.
July 19, Not visible.
July 20, Not seen.
July 26, Considered <13·0.
Aug. 12, Lp, Difficult. By flashes only.

(5190) R CAMELOPARDALIS—*continued.*

1923 Sept					
10	3673	OG	Ph	7 (2) v (1) 13, 7−7, 10+2, 11+3	10·7
11	3674	45	Bh	10+3, 11+4	10·5
11	3674	37	Lp	=8	10·3*b*
12	3675	...	Gr	10+5	10·3
13	3676	90	Bh	7−4, 10+10	10·0
13	3676	62	Wf	4 (4) v (6) 7	9·3
15	3678	37	Lp	=6	9·7
16	3679	90	Bh	4−2, 5+4	9·3*b*
17	3680	37	Lp	4 (2) v (1) 7	9·6*b*
18	3681	...	Sa	6−2, 7+2	9·8
21	3684	100	Lp	4 (1) v (2) 7	9·3*b*
22	3685	90	Bh	=4	9·0
26	3689	,,	,,	1−5, 4+1	8·9
29	3692	...	Gr	1−2	8·7
30	3693	100	Lp	=4	9·0*b*
30	3693	62	Wf	1−5, =4	9·0
Oct					
1	3694	90	Bh	=4	9·0
2	3695	32	Ca	4 (2) v (3) 4′	9·2
2	3695	...	Sa	4−1, 7+4	9·3
4	3697	37	Lp	=4	9·0
5	3698	90	Bh	=4	9·0
8	3701	62	Wf	1−5, =4	9·0
9	3702	22	Ni	=4	9·0
9	3702	90	Bh	4+2	8·8
11	3704	...	Sa	4−2, 7+3	9·4
13	3706	37	Lp	=4	9·0*b*
13	3706	...	Gr	1−2	8·7
14	3707	...	Sa	1−5, =2, 4+1	8·9
15	3708	32	Ca	1 (4) v (2) 4	8·8
17	3710	45	Bh	1−5	9·0
19	3712	90	,,	1−3	8·8
21	3714	,,	,,	1−1	8·6
22	3715	100	Lp	1 (2) v (2) 4	8·7*b*
22	3715	...	Sa	1−3, 4+2	8·8
22	3715	32	Ca	1 (3) v (3) 4	8·7
25	3718	90	Bh	=1	8·5
26	3719	22	Ni	1 (4) v (3) 4	8·8
27	3720	32	Ca	1 (1) v (4) 4	8·6
28	3721	62	Wf	1−2, 4+4	8·6
31	3724	...	Gr	1+1	8·4
Nov					
1	3725	90	Bh	1+2	8·3
3	3727	100	Lp	=1	8·5
5	3729	32	Ca	a (4) v (2) 1	8·3
5	3729	...	Sa	=1	8·5
7	3731	...	,,	1+1	8·4
7	3731	90	Bh	1+1	8·4
8	3732	100	Lp	v (1) 1 (2) 4	8·2
10	3734	22	Ni	1+1·5	8·3
13	3737	...	Gr	1+2	8·3
14	3738	100	Lp	v (1) 1 (2) 4	8·2*b*
16	3740	90	Bh	1+1	8·4
17	3741	100	Lp	v (2) 1 (3) 4, 1+3	8·1*b*
19	3743	90	Bh	1+2	8·3
23	3747	...	Sa	1+3, 4+10	8·1*b*
25	3749	32	Ca	a (2) v (4) 1	8·1
30	3754	90	Bh	1+2	8·3
Dec					
2	3756	,,	,,	1+2	8·3
3	3757	...	Sa	a−4, 1+3, 4+8	8·2
4	3758	100	Lp	1+5	8·0*b*
5	3759	90	Bh	=1	8·5
8	3762	...	Sa	1+2, 4+6	8·3
9	3763	22	Ni	P (4) v (2) 1	8·2
9	3763	100	Lp	1+5	8·0*b*
9	3763	90	Bh	=1	8·5
1923 Dec					
11	3765	62	Wf	=1	8·5
12	3766	90	Bh	=1	8·5
13	3767	...	Sa	a−5, 1+3	8·3
13	3767	32	Ca	1+4	8·1
15	3769	100	Lp	v (2) 1 (3) 4	8·1*b*
17	3771	90	Bh	1+1	8·4
19	3773	,,	,,	1+1	8·4
19	3773	100	Lp	v (2) 1 (3) 4	8·1*b*
22	3776	45	Bh	1+2	8·3
23	3777	37	Lp	v (2) 1 (2) 4, 1+5	7·9
24	3778	90	Bh	=1	8·5
24	3778	...	Sa	=1	8·5
28	3782	...	,,	a−7, 1+1	8·5
28	3782	90	Bh	1−1	8·6
30	3784	22	Ni	=1	8·5
1924 Jan					
2	3787	100	Lp	=1	8·5
2	3787	32	Ca	1 (3) v (2) 2	8·7
3	3788	90	Bh	1−4, 4+2	8·8
6	3791	,,	,,	1−5	9·0
6	3791	22	Ni	4 (1) v (5) 7	9·2
6	3791	100	Lp	1 (2) v (3) 4	8·7
10	3795	34	Sa	1−4, 4+2, 7+8	8·9
11	3796	90	Bh	1−5	9·0*b*
16	3801	22	Ni	4 (2) v (5) 7	9·2
20	3805	45	Bh	1−5, 4−2	9·2
23	3808	90	,,	1−10, 4−4	9·4
25	3810	22	Ni	4 (7) v (1) 7	9·7
26	3811	90	Bh	4−6, =5	9·7
27	3812	34	Sa	5−1, 7−2, 8+5	9·9
27	3812	100	Lp	7 (1) v (4) 11	10·0
Feb					
3	3819	37	,,	8 (2) v (2) 9	10·5
4	3820	90	Bh	7−6, 10+6	10·3
8	3824	62	Wf	8−5, =10	10·8
11	3827	45	Bh	10+1	10·7*b*
14	3830	94	Ni	11−1	11·0
14	3830	100	Lp	=13	11·2*b*
16	3832	90	Sa	<10	<10·8
18	3834	,,	Bh	=10, 11+2	10·8
22	3838	,,	,,	10−6, 11−3, =13	11·3
23	3839	94	Ni	=14	11·5
28	3844	90	Bh	11−6, 13−4	11·6*b*
Mar					
2	3847	,,	,,	11−10, 13−8, 16−3	12·0
2	3847	34	Sa	<15	<11·7
5	3850	90	Bh	=19, 24+4	12·2*b*
6	3851	94	Ni	16 (7) v (2) 24	12·5
8	3853	150	Lp	=24	12·7*b*
9	3854	OG	Ph	24−1	12·8
9	3854	90	Bh	24−1	12·8
9	3854	94	Ni	24+1	12·6
15	3860	90	Bh	24−2	12·9
26	3871	,,	,,	24−4	13·1
29	3874	94	Ni	24 (6) v (1) p	13·4
30	3875	OG	Ph	24−10	13·7*c*
Apr					
1	3877	,,	,,	q (1) v (1) r	14·0
5	3881	,,	,,	r−1	14·2

Oct. 9, Bh, Orange.
Dec. 17, 19, 22, Bh, Orange.
Dec. 24, 28, Bh, Yellow.
Jan. 16, Difficult.
Feb. 16, Not visible.
Feb. 23, Difficult.
Mar. 2, Sa, Not visible.

(5190) R CAMELOPARDALIS—*continued.*

1924					
Apr					
7	3883	OG	Ph	r−2	14·3*b*
9	3885	,,	,,	r−1	14·2
24	3900	157	Wf	r−5	14·6
27	3903	94	Ni	p−4	14·0
30	3906	90	Bh	Estimated	<13·0
May					
4	3910	M	Ph	r−3, 34+1	14·4*b*
5	3911	,,	,,	r−2·5	14·3*b*
5	3911	157	Wf	r−1	14·2
7	3913	94	Ni	p−2	13·8
7	3913	157	Wf	r−2	14·3
11	3917	231	,,	r−2	14·3
24	3930	94	Ni	24 (4) v (2) p	13·3
25	3931	157	Wf	24−5, p+4	13·2
26	3932	M	Ph	24−1	12·8
June					
2	3939	62	Wf	=19, 24+4	12·2
11	3948	90	Bh	10−6, 11−4	11·4
13	3950	,,	,,	10−5, 11−2	11·2
18	3955	,,	,,	10−2, =11	11·0
20	3957	M	Ph	10+1·5, 11+3	10·6
20	3957	90	Sa	=11	10·9*b*
22	3959	62	Wf	11−1, 13+2	11·0
23	3960	100	Lp	8 (2) v (2) 10	10·6*b*
24	3961	45	Bh	10+1, 11+3	10·7
26	3963	62	Wf	=10, 11+1	10·8
27	3964	90	Sa	7−8, =10, 11+3	10·7
27	3964	,,	Bh	4 (2) v (1) 10	10·2*b*
30	3967	45	,,	4−9, 7−1	9·9
30	3967	62	Wf	7 (5) v (5) 11	10·4
30	3967	M	Ph	10+3, 11+3	10·6*b*
July					
2	3969	94	Ni	11+1·5	10·8
4	3971	32	Ca	8 (1) v (3) 9	10·4
4	3971	45	Bh	=7	9·8
6	3973	62	Wf	7−3, 11+5	10·3
8	3975	22	Ni	7 (5) v (2) 8	10·2*b*
9	3976	45	Bh	7−1	9·9
10	3977	62	Wf	=7	9·8
11	3978	90	Bh	7−1	9·9
19	3986	,,	,,	7+1	9·7*b*
20	3987	62	Wf	4−7, 7+1	9·7
20	3987	22	Ni	7 (2) v (3) 8	10·0
21	3988	100	Lp	4 (2) v (1) 7	9·6
24	3991	62	Wf	4−5, 7+4	9·5
24	3991	45	Bh	4−6, 7−2	9·8
29	3996	,,	,,	=4	9·0
30	3997	62	Wf	4−1, 7+7	9·1
Aug					
2	4000	45	Bh	=4	9·0
5	4003	62	Wf	1−5, 4+1	8·9
5	4003	100	Lp	4 (3) v (2) 7	9·5
7	4005	90	Bh	4+2	8·8
15	4013	45	,,	1 (1) v (1) 4	8·7
15	4013	34	Sa	1−5, 4−2, =3, 7+6	9·1
18	4016	37	Lp	2 (1) v (2) 4	8·9*b*
19	4017	45	Bh	1−1	8·6
22	4020	62	Wf	1−2, 4+4	8·6
27	4025	,,	,,	=1	8·5
27	4025	90	Sa	=1	8·5

April 24, Held steadily, but difficult.
April 30, Not visible.
July 8, Difficult. Unsteady.
Aug. 7, Pale yellow.

1924					
Aug					
27	4025	90	Bh	1+1	8·4
30	4028	32	Ca	a (4) v (1) 1	8·3
31	4029	37	Lp	1+2	8·3
Sept					
2	4031	90	Bh	1+1	8·4
3	4032	34	Sa	a−4, 1+2	8·3
3	4032	62	Wf	1+0·5	8·4
5	4034	90	Bh	1+1	8·4
8	4037	,,	Sa	1+1	8·4
9	4038	,,	Bh	=1	8·5
10	4039	62	Wf	1+1, 4+7	8·3
14	4043	22	Ni	1 (4) v (4) 4	8·7
14	4043	45	Bh	1−1	8·6
17	4046	90	,,	1 (1) v (3) 4	8·6
17	4046	64	Sa	1+1	8·4
18	4047	32	Ca	a (5) v (1) 1	8·4
22	4051	100	Lp	v (2) 1 (2) 4, 1+3	8·0
24	4053	34	Sa	1−3, 4+2	8·8
26	4055	62	Wf	1−2, 4+5	8·6
26	4055	90	Bh	1 (1) v (2) 4	8·6
28	4057	37	Lp	1 (2) v (2) 4	8·7
Oct					
2	4061	90	Bh	1 (1) v (1) 4	8·7
3	4062	37	Lp	4 (2) v (2) 7	9·4
5	4064	62	Wf	1−5, 4+2	8·9
6	4065	34	Sa	4−4, 7+4	9·4
6	4065	90	Bh	4+1	8·9
11	4070	,,	,,	4−1	9·1
16	4075	62	Wf	4−1, 7+5	9·2
17	4076	32	Ca	=5	9·7
22	4081	34	Sa	7−3, 8−1, 9+5	10·2
23	4082	37	Lp	8 (2) v (2) 9	10·5
23	4082	22	Ni	=7	9·8
23	4082	34	Li	4 (7) v (3) 7	9·6
24	4083	90	Bh	4 (2) v (1) 7	9·6
26	4085	44	Li	4 (8) v (2) 7	9·7
30	4089	90	Bh	7−3	10·1
31	4090	32	Ca	9 (1) v (1) 10	10·7
Nov					
3	4093	90	Bh	10+1, 11+3	10·7
3	4093	,,	Sa	8−4, =10	10·8
4	4094	75	Lp	10+1	10·7
4	4094	94	Ni	7 (8) v (1·5) 8	10·2
8	4098	45	Bh	=10, 11+1	10·8
12	4102	193	Li	11 (5) v (5) 13	11·1
15	4105	90	Bh	10−4, 11−2	11·2
16	4106	94	Ni	11 (3) v (3) 14	11·2
17	4107	,,	Li	13 (5) v (5) 14	11·4
20	4110	90	Sa	=18	11·8
24	4114	45	Bh	10 (1) v (1) 19	11·5
29	4119	90	,,	10 (2) v (1) 19	11·7
30	4120	94	Ni	=16	11·8
Dec.					
2	4122	90	Bh	=19	12·2
3	4123	94	Li	=18	11·8
6	4126	90	Bh	19 (1) v (1) 24	12·4
15	4135	193	Li	<19	<12·2
19	4139	90	Bh	=24	12·7
24	4144	,,	,,	24−1	12·8
24	4144	94	Ni	24 (4) v (2) p	13·3
28	4148	,,	,,	24 (4) v (1) p	13·4
28	4148	90	Bh	24−3	13·0

Nov. 4, Ni, With 22, 10·2. Difficult.
Nov. 12, Dec. 3, Difficult.

(2096) V CAMELOPARDALIS. (V. 5.)

H.D. 054974.

As stated in B.A.A. Memoir XXV. 98, the magnitudes for some of the comparison stars, given in **H.A., 57,** 233 do not seem to agree with the usual Harvard scale. The following values have consequently again been adopted :—

H.C.O. Letter.	Mag.	H.C.O. Letter.	Mag.
e	10·2	q	13·5
n	12·2	r	13·2
o	12·5		

For all the other Harvard stars, the magnitudes given in **H.A., 57** have been retained.

It is to be noted that the comparison star "t" does not belong to the Harvard series. It comes from the "Publications of the Vassar College Observatory," No. 3, 1913, p. 65, and in the following observations is rated $13^{m}\cdot5$.

Date.	Julian Date.	Inst.	Observer.	Comparisons.	Deduced Mag.
1920 Jan					
1	2325	296	Th	q−3	13·8*b*
8	2332	75	Bg	<r	<13·2*b*
8	2332	157	Th	q−3	13·8
13	2337	120	Br	Estimated	13·8
15	2339	90	Bh	,,	13·5
15	2339	157	Th	,,	13·7*b*
16	2340	75	Bg	o−6, r+3	13·0
19	2343	240	Br	Estimated	13·8
19	2343	300	Th	,,	13·6
24	2348	75	Bg	r−2	13·4
24	2348	240	Br	Estimated	13·6
24	2348	250	Th	,,	13·6
26	2350	90	Bh	,,	<13·0
Feb					
7	2362	75	Bg	r−2	13·4
7	2362	240	Br	Estimated	13·5*b*
8	2363	300	Th	,,	13·5*b*
11	2366	90	Bh	n−4, o−2	12·7*b*
11	2366	157	Th	Estimated	13·5
13	2368	,,	,,	,,	13·2
16	2371	240	Br	r (1) v (1) q	13·4
17	2372	110	Bg	o−7, r+2	13·1
17	2372	90	Bh	n−4, o−2	12·7*b*
19	2374	55	Bg	o−6, r+3	13·0
21	2376	120	Br	r+2	13·0
23	2378	75	Bg	o−4, r+5	12·8*b*
23	2378	120	D	=o	12·5*b*
23	2378	90	Bh	<o	<12·5*b*
27	2382	157	Th	n+2	12·0*b*

Jan. 1, 12¼-in. spec.
Jan. 8, Bg, Glimpsed. Th, About.
Jan. 13, Perhaps a little brighter.
Jan. 15, Bh, About. Glimpsed. Difficult. Th, About.
Jan. 26, Not seen.
Feb. 7, Bg, About. Br, Difficult.
Feb. 17, Bg, About.
Feb. 23, D and Bh, Glimpsed. Difficult.

Date.	Julian Date.	Inst.	Observer.	Comparisons.	Deduced Mag.
1920 Feb					
27	2382	90	Bh	<n	<12·2*b*
29	2384	120	Br	m−2, n+4	12·1
Mar					
7	2391	160	,,	g−3, h+1	11·6
7	2391	90	Bh	g−5	11·8
8	2392	120	Bn	h (1) v (1) k	11·8
8	2392	157	Th	g−1	11·4
8	2392	90	Bh	g−2	11·5
11	2395	,,	,,	g+3	11·0
11	2395	157	Th	e (7) v (3) g, g+3	11·0
12	2396	55	Bg	=f, g+2	11·1
12	2396	160	Br	g+3	11·0
12	2396	120	Bn	g+2	11·1
12	2396	60	D	g−2	11·5*b*
15	2399	,,	,,	e−5, g+3	10·9
16	2400	80	AB	e−5·5, g+2	10·9*b*
17	2401	90	Bh	g+5	10·8
17	2401	157	Th	e−2	10·4
18	2402	,,	,,	=e	10·2*b*
18	2402	55	Bg	d−7, f+4	10·7*b*
18	2402	45	Br	d−3	10·3
18	2402	50	Bn	d (2) v (1) g	10·9
18	2402	60	D	e−5, g+4	10·8
19	2403	80	AB	e−4·5, f+2	10·8
20	2404	,,	,,	e−3·5, f+3	10·7
20	2404	55	Bg	d−4, f+7	10·4
20	2404	50	Bn	d (3) v (1) g	11·0
21	2405	90	Bh	g+7	10·6
21	2405	60	D	e−5, g+4	10·8
22	2406	55	Bg	d−2, f+9	10·2
22	2406	80	AB	e−3, f+5	10·5
23	2407	30	D	e−4, g+4	10·8
26	2410	90	Bh	d−3, g+10	10·3
27	2411	80	AB	e−3	10·5*b*

Feb. 27, Bh, Not seen.
Mar. 12, D, Difficult.

(2096) V CAMELOPARDALIS—*continued.*

1920 Mar					
30	2414	60	D	e−2, g+6	10·6*b*
31	2415	90	Bh	c−6, d+1	9·9
Apr					
6	2421	80	AB	e−3, f+4·5	10·6*b*
6	2421	60	D	e−2, g+6	10·6
10	2425	90	Bh	c−5, d+2	9·8
11	2426	60	D	e−2, g+5	10·6
11	2426	80	AB	e−3, f+4·5	10·6
12	2427	55	Bg	d−2, f+9	10·2*b*
12	2427	90	Bh	c−5, d+2	9·8
16	2431	160	Br	=d, e+2	10·0
16	2431	90	Bh	c−5, d+2	9·8
16	2431	30	D	e−3·5, g+4·5	10·7
16	2431	62	Th	=d, e+1·5	10·0
21	2436	55	Bg	d−1	10·1
21	2436	75	Bn	d (1) v (3) g	10·3
21	2436	90	Bh	d−1	10·1
21	2436	62	Th	d−3, e−2	10·4
21	2436	45	Br	d−3	10·3
22	2437	80	AB	e−5, g+5	10·8*b*
23	2438	60	D	e−4, g+4	10·8
27	2442	90	Bh	d−5	10·5
29	2444	160	Br	d−2	10·2
30	2445	62	Th	d−2	10·2*b*
May					
2	2447	55	Bg	d−8, f+3	10·8*b*
4	2449	120	Bn	d (4) v (1) g	11·1
4	2449	90	Bh	d−8, g+5	10·8
5	2450	80	AB	f−2, g+1·5	11·2
7	2452	160	Br	e−4, g+7	10·6
7	2452	50	Bn	d (3) v (1) g	11·0
7	2452	90	Bh	d−8, g+5	10·8
7	2452	60	D	e−6, g+2	11·0
9	2454	,,	,,	=g	11·3
9	2454	80	AB	g+1·5	11·2
10	2455	55	Bg	f−2, =g	11·3
12	2457	60	D	g−1, h+2	11·4*b*
12	2457	90	Bh	g+3	11·0
13	2458	120	Bn	g (2) v (3) h	11·4
13	2458	157	Th	g+2	11·1*b*
14	2459	60	D	g−1, h+2	11·4
14	2459	160	Br	g+2	11·1
19	2464	120	Bn	g (3) v (1) h	11·5
21	2466	90	Bh	g−1	11·4
23	2468	146	Th	g−1	11·4*b*
23	2468	120	Br	g+1	11·2
23	2468	,,	Bn	h (2) v (1) k	11·8
29	2474	90	Bh	g−5	11·8
June					
6	2482	120	Bn	l−1	12·3
6	2482	80	AB	l−1	12·3*c*
8	2484	120	Br	g−5, m+2	11·9
8	2484	90	Bh	g−8, n+5	11·9
8	2484	120	D	g−5, l+3	11·9*b*
9	2485	,,	Bn	l (1) v (3) n, m−1	12·2
11	2487	,,	D	l+2	12·0*b*
19	2495	,,	Bn	=o	12·5
20	2496	,,	Br	=m	12·2*b*
20	2496	80	AB	<l	<12·2*b*
23	2499	75	Bg	m−3, n+1	12·3
July					
8	2514	110	,,	=o	12·5*b*

Mar. 30, Yellow.
April 11, D, Dark yellow.
May 23, Th, 12¼-in. spec.
June 8, D, Difficult.
June 20, AB, Not seen.
July 8, About.

1920 July					
10	2516	80	AB	l−4, n−1	12·4
13	2519	110	Bg	o−1	12·6
15	2521	120	Bn	o (2) v (1) p	12·9
18	2524	,,	Br	n−3	12·5
Aug					
6	2543	,,	,,	n (1) v (1) r	12·7
8	2545	80	AB	<(n−2)	<12·4
Sept					
8	2576	120	D	<n	<12·2
10	2578	240	Br	r+2	13·0
12	2580	80	AB	<(n−2)	<12·4
12	2580	117	Gi	n−5	12·7
19	2587	75	Bg	=q	13·5
Oct					
4	2602	117	Gi	=q	13·5
6	2604	240	Br	=q	13·5
18	2616	,,	,,	<q	<13·5
28	2626	117	Gi	<p	<13·1
Nov					
5	2634	120	Br	<q	<13·5
14	2643	117	Gi	Estimated	<14·1
16	2645	240	Br	,,	<13·5
Dec					
24	2683	117	Gi	<o	<12·5
1921 Jan					
7	2697	120	Br	<q	<13·5
17	2707	117	Gi	<t	<13·5
28	2718	,,	,,	<t	<13·5
Feb					
13	2734	,,	,,	<t	<13·5
26	2747	120	Bn	<p	<13·1
Mar					
1	2750	117	Gi	<t	13·5
31	2780	,,	,,	<t	<13·5
Apr					
4	2784	60	D	<k	<11·9
4	2784	120	Br	<q	<13·5
7	2787	,,	Bn	<o	<12·5
15	2795	60	D	<g	<11·3
27	2807	117	Gi	<t	<13·5
29	2809	75	Bg	<r	<13·2
29	2809	120	Br	<q	<13·5
30	2810	50	Bn	<p	<13·1
May					
11	2821	117	Gi	<t	<13·5
June					
2	2843	120	Br	<o	<12·5
7	2848	,,	,,	<o	<12·5
7	2848	117	Gi	<t	<13·5
25	2866	,,	,,	<t	<13·5
July					
2	2873	180	Bg	<o	<12·5
5	2876	117	Gi	<t	<13·5
9	2880	60	D	<n	<12·2

Aug. 8, Not seen.
Sept. 12, AB, Not seen. Gi, Difficult.
Sept. 19, About.
Oct. 18, Glimpsed.
Nov. 5, 16, Jan. 7, Feb. 26, Apr. 4 Br., 7, 29, Bg and Br, 30, Not seen.
April 4, D, Difficult.
April 7, t.
June 2, 7 Br, July 26, 29, Aug. 2, Not seen.
July 2, Perhaps glimpsed.

(2096) V CAMELOPARDALIS—*continued.*

1921 July					
26	2897	90	Bh	Estimated	<13·0
29	2900	150	,,	<p	<13·1
30	2901	117	Gi	=r	13·2
Aug					
2	2904	150	Bh	<p	<13·1
6	2908	90	,,	=n	12·2*b*
6	2908	120	Br	=n	12·2*b*
8	2910	,,	,,	n+2	12·0
8	2910	55	Bg	m−3, n+1	12·3
15	2917	90	Bh	f−2, =g	11·3
16	2918	,,	,,	=f	11·1
17	2919	117	Gi	e−10, g+3	11·1
19	2921	120	Br	g+2	11·1
19	2921	90	Bh	f+2, g+4	10·9
25	2927	,,	,,	f+4, g+6	10·7
29	2931	,,	,,	f+5	10·6
29	2931	117	Gi	e−1·5, g+6	10·5*b*
30	2932	45	Br	e−2	10·4
31	2933	60	D	e−5, g+4	10·8
Sept					
1	2934	,,	,,	e−3, g+5	10·7
3	2936	30	,,	e−3, g+6	10·6
4	2937	90	Bh	d−2	10·2
5	2938	,,	,,	c−6, d+1	9·9
5	2938	120	Br	=e	10·2
5	2938	30	D	e−3, g+6	10·6
7	2940	,,	,,	e−3, g+6	10·6
7	2940	55	Bg	d−2, f+9	10·2
8	2941	75	Gi	c−4, d+1·5	9·8
10	2943	90	Bh	d+5	9·5
10	2943	45	Br	d+1	9·9
14	2947	60	D	e−4, g+5	10·7
16	2949	90	Bh	d+3	9·7
21	2954	75	Bg	d−5, f+6	10·5
21	2954	120	Bn	f+1	11·0
21	2954	60	D	e−5, g+4	10·8*b*
23	2956	,,	,,	e−6, g+3	10·9*b*
24	2957	160	Br	e−5, g+5	10·8
24	2957	90	Bh	d−9, f+2	10·9*b*
25	2958	,,	,,	f+3	10·8
25	2958	55	Bg	d−7, f+4	10·7
25	2958	50	Bn	f+1	11·0
25	2958	117	Gi	e−2·5, g+8	10·5
27	2960	60	D	e−6, g+3	10·9
28	2961	55	Bg	d−8, f+3	10·8
29	2962	60	D	g+2	11·1*b*
29	2962	120	Bn	e (4) v (1) f	10·9
30	2963	90	Bh	=f, =g	11·2*b*
Oct					
5	2968	55	Bg	d−9, f+2	10·9
5	2968	50	Bn	f+1	11·0
5	2968	90	Bh	=f	11·1
5	2968	30	D	e−6, g+3	10·9
6	2969	117	Gi	e−2, g+10	10·4*b*
8	2971	50	Bn	f+1	11·0
14	2977	160	Br	g+1	11·2
16	2979	75	Bg	=f, g+2	11·1*b*
16	2979	90	Bh	=f, =g	11·2
23	2986	,,	,,	=f	11·1
23	2986	120	Bn	g+0·5	11·3
25	2988	,,	Br	g−1	11·4
31	2994	90	Bh	=f	11·1
31	2994	117	Gi	e−5, g+2	10·9

Aug. 6, Br, About. Difficult.
Sept. 21, D, Difficult.

1921 Nov					
6	3000	55	Bg	f−1, g+1	11·2
6	3000	120	Br	=g	11·3
6	3000	,,	Bn	g−1	11·4
12	3006	90	Bh	f−2	11·3
23	3017	55	Bg	h−3, =k	11·9
24	3018	90	Bh	f−4	11·5
24	3018	60	D	g−5, k+1	11·8*b*
28	3022	75	Gi	g−2, =h	11·6
29	3023	90	Bh	f−5	11·6
Dec					
3	3027	120	Br	g−4, l+4	11·8
3	3027	90	Bh	g−2	11·5
13	3037	,,	,,	g−2	11·5
15	3039	150	Wf	=m	12·2
21	3045	117	Gi	=l	12·2*b*
25	3049	90	Bh	g−4	11·7
25	3049	120	Br	l−1	12·3
28	3052	75	Bg	m−3, n+1	12·3
29	3053	,,	Bn	o−1	12·6*b*
30	3054	90	Bh	g−6, n+7	11·7
30	3054	62	Wf	m (1) v (1) n	12·2
1922					
Jan					
4	3059	120	Br	n+1	12·1
4	3059	,,	D	<r	<12·2
5	3060	117	Gi	l (3) v (3) n	12·1
17	3072	62	Wf	=n	12·2
20	3075	75	Bg	o−3, q+4	13·0
23	3078	150	Wf	o−3, p+1	12·9
Feb					
1	3087	110	Bg	=q	13·5*b*
4	3090	157	Wf	p+2	12·9
17	3103	120	Br	=r	13·2
18	3104	180	Bg	=r	13·2
19	3105	230	Wf	=p	13·1
20	3106	117	Gi	q−1	13·6
27	3113	150	Wf	p (1) v (1) q	13·3
Mar					
5	3119	,,	,,	=r	13·2
19	3133	,,	,,	=q	13·5
26	3140	231	,,	q−3	13·8
31	3145	240	Br	q−4	13·9
Apr					
4	3149	231	Wf	q−2	13·7
19	3164	231	Wf	q−5	14·0
29	3174	157	,,	Estimated	14·2*b*
May					
12	3187	231	,,	<q	<13·5*b*
19	3194	117	Gi	<t	<13·5
22	3197	231	Wf	<p	<13·1*c*
29	3204	,,	,,	Estimated	<14·2
June					
18	3224	,,	,,	Estimated	<14·2
23	3229	117	Gi	<t	<13·5
26	3232	157	Wf	<q	<13·5*b*
July					
20	3256	117	Gi	<t	<13·5
26	3262	157	Wf	<q	<13·5

Nov. 24, D, Difficult.
Feb. 1, About.
April 29, A glimpse with averted vision.
May 12, Invisible.
May 22, June 18, July 26, Aug. 17, Invisible.
May 29, Variable suspected.
June 26, Perhaps q−3=13·8.

(2096) V CAMELOPARDALIS—*continued.*

1922					
Aug					
17	3284	231	Wf	<t	<13·5
18	3285	120	Br	<q	<13·5
18	3285	117	Gi	<t	<13·5
20	3287	180	Bg	<q	<13·5
23	3290	231	Wf	<q	<13·5
Sept					
10	3308	157	,,	<t	<13·5
16	3314	,,	,,	<q	<13·5
20	3318	117	Gi	<t	<13·5
20	3318	110	Bg	<q	<13·5
29	3327	240	Br	<o	<12·5*b*
Oct					
11	3339	231	Wf	<q	<13·5
14	3342	120	Br	<r	<13·2
17	3345	157	Wf	<q	<13·5*c*
23	3351	120	Bn	<p	<13·1
Nov					
10	3369	231	Wf	<q	<13·5
14	3373	240	Br	<r	<13·2
17	3376	157	Wf	q−6·5	14·2*c*
17	3376	117	Gi	<t	<13·5*b*
19	3378	240	Br	<q	<13·5
24	3383	120	,,	<q	<13·5
24	3383	,,	Bn	<p	<13·1
Dec					
12	3401	117	Gi	<t	<13·5
19	3408	120	Bn	<o	<12·5
1923					
Jan					
4	3424	90	Bh	<o	<12·5*b*
8	3428	,,	,,	<o	<12·5
9	3429	94	Ii	<o	<12·5
13	3433	157	Wf	q−5	14·0
14	3434	90	Bh	o−4	12·9
17	3437	117	Gi	=t	13·5
18	3438	120	Br	r+2	13·0
20	3440	90	Bh	=n, =o	12·4*b*
23	3443	157	Wf	o−4, r+4	12·9
24	3444	120	Bn	o (3) v (1) p	13·0
25	3445	75	Bg	o−2, r+7	12·6
27	3447	90	Bh	g−10, n+3	12·1
Feb					
3	3454	,,	,,	g−5	11·8
4	3455	120	Br	g−4, m+2	11·9
4	3455	50	Bn	h−4, m+2	12·0
7	3458	62	Wf	g−1, h+2	11·4
8	3459	90	Bh	g−2	11·5
11	3462	55	Bg	f−2, =g	11·3
16	3467	90	Bh	d−8, g+5	10·8
18	3469	55	Bg	d−10, g+3	11·0
23	3474	,,	,,	d−7, f+4	10·7
23	3474	90	Bh	d−6	10·6*b*
25	3476	,,	,,	d−6, g+7	10·6
27	3478	,,	,,	d−5	10·5*b*
Mar					
2	3481	,,	,,	g+5	10·8
5	3484	,,	,,	d−10, g+5	10·9
5	3484	55	Bg	d−5, f+6	10·5
6	3485	120	Bn	d (3) v (1) e	10·2

Aug. 18, Br, Sept. 29, Oct. 14, Not seen.
Aug. 20, Perhaps glimpsed.
Nov. 14, 19, 24, Br, Jan. 4, Not seen.
Nov. 17, Wf, Pretty certainly seen.
Dec. 12, Just glimpsed by averted vision.
Jan. 8, Glimpsed.
Jan. 18, About.
Mar. 2, Yellow.

1923					
Mar					
8	3487	90	Bh	d−8	10·8
13	3492	,,	,,	d−8, g+5	10·8
15	3494	117	Gi	e (3) v (4·5) g	10·5
17	3496	55	Bg	d−7, f+4	10·4
17	3496	50	Bn	e (3) v (1) g	11·1
17	3496	90	Bh	d−7	10·4
21	3500	,,	,,	d−5	10·3
24	3503	120	Bn	e (3) v (1) g	11·1
26	3505	62	D	g+3	11·4
26	3505	90	Bh	d−5	10·3
30	3509	75	Gi	e (2·5) v (7) g	10·3
Apr					
1	3511	90	Bh	g+5	10·4
6	3516	62	Wf	g+2, h+4	11·1
8	3518	55	Bg	g−1, h+2	11·1
8	3518	75	Bn	g−1	11·1
8	3518	90	Bh	g+2	11·1
10	3520	62	Wf	g−2, h+1	11·1
13	3523	90	Bh	g+3	11·1
14	3524	55	Bg	g−3, =h	11·1
15	3525	150	Wf	g+1, h+4	11·1
20	3530	60	D	g−5	11·1
25	3535	117	Gi	g+2	11·1
27	3537	90	Bh	g−1	11·1
May					
3	3543	,,	,,	g−3	11·1
3	3543	55	Bg	k (2) v (1) l	12·1
5	3545	60	D	g−5, h−2, k+1	11·1
6	3546	62	Wf	h−3, l+3	11·1
7	3547	120	Br	m+1	12·1
10	3550	60	D	k−2, l+1	12·1
11	3551	90	Bh	g−7, n+6	11·1
13	3553	60	D	k−2, l+1·5	12·1
16	3556	90	Bh	g−7	12·1
19	3559	117	Gi	k (3) v (2) l, =m	12·1
20	3560	150	Wf	l−1, n+3	12·1
30	3570	90	Bh	g−10	12·1
June					
3	3574	150	Wf	l−3, n+1	12·1
11	3582	OG	Ph	l−5, =n, =o	12·1
14	3585	157	Wf	o−3, q+6·5	12·1
July					
1	3602	90	Bh	=n, =o	12·1
8	3609	157	Wf	o−4	12·1
9	3610	117	Gi	=p, r+4	13·1
19	3620	157	Wf	=r, q+3	13·1
20	3621	OG	Ph	=r	13·1
Aug					
3	3635	75	Bg	<r	<13·1
6	3638	157	Wf	=q	13·1
7	3639	OG	Ph	=r	13·1
11	3643	,,	,,	r−2, q+1	13·1
12	3644	157	Wf	q−2	13·1
Sept					
3	3666	231	,,	q−3	13·1
6	3669	OG	Ph	q−5	14·1
7	3670	231	Wf	q−5·5	14·1
8	3671	120	Br	<q	<13·1
13	3676	300	Wf	q−6	14·1

Mar. 26, D, Difficult.
April 20, Difficult.
July 8, Sept. 13, Difficult.
Aug. 3, Glimpsed.
Aug. 12, Very difficult.
Sept. 6, Very faint and difficult. About limit of visibility.
Sept. 8, Oct. 1, Br, Nov. 5, Not seen.

(2096) V CAMELOPARDALIS—*continued.*

1923 Sept 15	3678	OG	Ph	q−5, r−7	14·0*b*
Oct 1	3694	120	Br	<q	<13·5*b*
1	3694	157	Wf	<q	<13·5
9	3702	150	,,	<q	<13·5*b*
Nov 5	3729	120	Br	<q	<13·5
Dec 9	3763	,,	,,	<q	<13·5
12	3766	231	Wf	<q	<13·5
1924 Jan 6	3791	120	Br	<q	<13·5*b*
27	3812	240	,,	Estimated	14·2*b*
Feb 8	3824	157	Wf	q−5	14·0*b*
26	3842	240	Br	<q	<13·5*b*
Mar 10	3855	OG	Ph	q−5	14·0*c*
29	3874	240	Br	<q	<13·5
30	3875	94	Bl	Estimated	<14·0
Apr 1	3877	OG	Ph	q−5	14·0*c*
5	3881	,,	,,	=q	<13·5*c*
7	3883	231	Wf	Estimated	<14·5
23	3899	,,	,,	,,	<14·5
29	3905	,,	,,	,,	14·7
May 4	3910	M	Ph	<q	<13·5*c*
5	3911	231	Wf	<t	<13·5
11	3917	,,	,,	<q	<13·5*b*
23	3929	,,	,,	<q	<13·5
27	3933	M	Ph	Estimated	14·0*c*
29	3935	231	Wf	<q	<13·5*b*
June 1	3938	,,	,,	<t	<13·5
7	3944	,,	,,	q−10	14·5
20	3957	M	Bh	=q	13·5
22	3959	157	Wf	r−3, q+1	13·5
23	3960	94	Bl	Estimated	<12·5
24	3961	157	Wf	o−5, r+1	13·1
26	3963	,,	,,	o−5, r+4	12·9
29	3966	120	D	o−5, p+2	13·0
July 1	3968	150	Bh	<o	<12·5
3	3970	,,	Wf	l−4, =n	12·4
4	3971	M	Ph	l−3, n−3	12·5
6	3973	120	D	n−1, o+3	12·3
8	3975	150	Wf	l−1, n+3	12·1
9	3976	120	D	=l	12·2*b*
9	3976	,,	Br	l+1	12·1*b*
9	3976	90	Bh	n+2	12·0
10	3977	120	Bn	l−1	12·3
1924 July 11	3978	M	Ph	g (1) v (1) m, m+5	11·7
14	3981	120	D	g−5, h−2, k+1	11·8*b*
14	3981	90	Bh	g−5, n+8	11·8
19	3986	75	Bg	=f, g+2	11·1*b*
21	3988	120	Bn	g−2, l+5	11·6
22	3989	62	Wf	e−7, f+2	10·9
23	3990	90	Bh	=g	11·3
24	3991	,,	,,	g+1	11·2
24	3991	75	Bg	=g	11·3
26	3993	90	Bh	g+3	11·0
27	3994	62	Wf	e−5, g+4	10·8
29	3996	50	Bn	f+2	10·9
29	3996	90	Bh	g+3	11·0
31	3998	,,	,,	g+3	11·0
31	3998	60	D	f−1, g+2	11·2
Aug 2	4000	90	Bh	g+4	10·9
4	4002	62	Wf	e−5, f+3	10·7
5	4003	50	Bn	e−7, f+2	10·9
7	4005	75	Bg	=e	10·2
7	4005	90	Bh	d−8, g+5	10·8
8	4006	60	D	e−6, g+3	10·9
10	4008	62	Wf	d−3, e−2	10·4
12	4010	120	Bn	e+1	10·1*b*
15	4013	90	Bh	d−6, g+7	10·6
17	4015	60	D	e−7, g+4	10·9
18	4016	75	Bg	e (1) v (5) g	10·4*b*
19	4017	50	Bn	e (2) v (1) f	10·8
19	4017	120	Br	e−3	10·5
19	4017	90	Bh	d (1) v (1) g	10·7
22	4020	55	Bg	e (1) v (1) g	10·6*b*
22	4020	62	Wf	e−5, g+5	10·8
27	4025	60	D	e−5, g+4	10·8
27	4025	90	Bh	d (1) v (2) g	10·4
31	4029	45	,,	d (1) v (1) g	10·7
31	4029	62	Wf	e−6, g+4	10·9
31	4029	75	Bn	f+1, g+3	11·0
31	4029	55	Bh	e (2) v (1) f	10·8
Sept 2	4031	90	Bh	d (1) v (1) g	10·7
5	4034	,,	,,	d (2) v (1) g	10·9
6	4035	94	Bl	f (2) v (1) g, =g	11·3
7	4036	62	Wf	g+1, h+4	11·2
8	3037	120	Bn	f−2, g+0·5	11·3
12	4041	90	Bh	d (3) v (1) g	11·0
16	4045	,,	,,	d (3) v (1) g	11·0
19	4048	60	D	g+2	11·1
22	4051	,,	,,	g−3, k+4	11·6
22	4051	94	Bl	e (2) d (5) v (1) g	11·1
22	4051	120	Bn	g−2, h+1	11·5
22	4051	55	Bg	f (1) v (1) g	11·2
24	4053	90	Bh	=g	11·3*b*
26	4055	,,	,,	d−9, g+4	10·9
27	4056	120	Bn	g (3) v (1) h	11·5
27	4056	62	Wf	f−1, g+1	11·2
27	4056	160	Br	g−6, l+3	11·9
29	4058	94	Bl	g (3) v (2) k	11·7
29	4058	90	Bh	g−1	11·4
Oct 5	4064	,,	,,	g+2	11·1
5	4064	62	Wf	=k, m+3	11·9
11	4070	94	Bl	=k	11·9
11	4070	90	Bh	=g	11·3
15	4074	,,	,,	g−2	11·5
23	4082	,,	,,	g−6, n+2	12·0

Sept. 15, Variable believed well below $14^{m}\cdot0$.
Oct. 1, Wf, Doubtfully glimpsed.
Jan. 6, Feb. 26, Mar. 29, Not seen.
Jan. 27, Perhaps glimpsed. Much <q.
Feb. 8, Glimpsed several times.
Mar. 10, April 1, May 27, Doubtfully glimpsed.
April 5, Invisible. q appears much fainter than 13·5.
April 7, May 4, 5, 11, 23, Invisible.
May 29, Very doubtfully suspected.
June 1, Once or twice suspected.
June 7, Steadily held.
July 1, Not seen.
July 9, D, About. Difficult.
July 14, D, Difficult.

(2096) V CAMELOPARDALIS—*continued.*

1924 Oct					
23	4082	120	Br	=l	12·2
23	4082	,,	Bn	l−1, m−1, n+3	12·1
27	4086	90	Bh	g (3) v (1) n	12·0*b*
31	4090	,,	,,	n+2	12·0
Nov					
3	4093	,,	,,	n+2	12·0
3	4093	94	Bl	k (2) v (1) n, l (2) v (1) n	12·2
8	4098	90	Bh	=n	12·2*b*
15	4105	,,	,,	n−1	12·3
15	4105	94	Bl	l (4) v (1) m, =n	12·2
24	4114	90	Bh	n−2	12·4
27	4117	110	Bg	o (1) v (1) r	12·9
29	4119	90	Bh	n−3	12·5

Nov. 27, r difficult.

1924 Nov					
30	4120	120	D	<p	<13·1
Dec					
2	4122	90	Bh	n−5	12·7
9	4129	,,	,,	n−5, o−3	12·8
14	4134	,,	,,	n−9, =q	13·3
19	4139	,,	,,	n−8, =q	13·3
22	4142	94	Bl	o (5) v (2) r, o (6) v (1) r	13·1
24	4144	150	Bh	n−10	13·2
28	4148	110	Bg	=q	13·5
30	4150	150	Bh	n−10	13·2
30	4150	M	Ph	=r	13·2

Dec. 22, Very difficult.
Dec. 28, About.

(1637) X CAMELOPARDALIS. (V. 7.)

H.D. 043274.

Date.	Julian Date.	Inst.	Observer.	Comparisons.	Deduced Mag.
1920 Jan					
1	2325	90	Wh	e (1) v (1) k	10·9
1	2325	,,	Bh	k−1, l+5	11·8
4	2328	,,	,,	k+4	11·3
8	2332	,,	,,	e−8, g+2	10·9
8	2332	62	Th	f−1	10·7
13	2337	90	Bh	e−2	10·3
15	2339	,,	,,	e+1	10·0
15	2339	62	Th	e+1	10·0
15	2339	90	Wh	e (1) v (2) k	10·6
17	2341	80	AB	e−1, f+3	10·3
18	2342	,,	,,	e−2, f+2	10·4
19	2343	30	Bn	c′+2	9·1
21	2345	50	,,	c (4) v (1) c′	9·2
21	2345	90	Bh	c−7, e+7	9·4
22	2346	80	AB	c−5·5, e+3	9·6
23	2347	30	D	c−5, d+6	9·2
24	2348	,,	Bn	b+1	8·4
24	2348	90	Bh	b+1	8·4
24	2348	,,	Wh	b−2	8·7
25	2349	80	AB	c−4, e+5	9·4
26	2350	90	Bh	b+3	8·2
26	2350	,,	Wh	=b	8·5
29	2353	80	AB	b+2	8·3
31	2355	90	Wh	b+2	8·3
31	2355	45	Bh	b+6	7·9
Feb					
1	2356	80	AB	b+3·5	8·2*b*
4	2359	90	Bh	b+6	7·9
5	2360	25	AB	b+4	8·1
6	2361	,,	Bn	a+1	7·7
6	2361	90	Bh	b+6	7·9
7	2362	25	AB	b+3	8·2
8	2363	90	Wh	b+3	8·2
11	2366	30	Bn	a (1) v (2) b	8·0
11	2366	157	Th	b+2	8·3
13	2368	90	Bh	b+6	7·9

Date.	Julian Date.	Inst.	Observer.	Comparisons.	Deduced Mag.
1920 Feb					
13	2368	62	Th	b+2	8·
13	2368	25	AB	b+3	8·
14	2369	,,	,,	b+2	8·
16	2371	30	D	c+1	8·
17	2372	90	Wh	b−2	8·
17	2372	30	Bn	a (1) v (2) b	8·
17	2372	90	Bh	b+5	8·
18	2373	25	AB	b+3	8·
21	2376	90	Wh	b+2	8·
23	2378	30	D	a (4) v (1) c, c+2	8·
23	2378	90	Bh	b+3	8·
26	2381	50	Tm	=b	8·
26	2381	90	Wh	=b	8·
27	2382	,,	Bh	b+2	8·
29	2384	25	AB	b+2·5	8·
Mar					
2	2386	90	Bh	b−2, =c	8·
3	2387	50	Bn	b+2·5	8·
3	2387	,,	Tm	=b	8·
6	2390	80	AB	c+2	8·
7	2391	90	Wh	b−2	8·
7	2391	,,	Bh	b−4, e+12	8·
8	2392	50	Bn	b−2, c+0·5	8·
8	2392	,,	Tm	b (1) v (9) d	8·
8	2392	62	Th	b−2	8·
11	2395	90	Bh	c−1	8·
11	2395	50	Tm	b (1) v (2) d	8·
11	2395	62	Th	b−2	8·
12	2396	50	Bn	c−2	8·
12	2396	30	D	d+3	9·
12	2396	90	Wh	b (1) v (1) e	9·
15	2399	30	D	c−7, d+3	9·
16	2400	25	AB	b−4, e+5	9·

Mar. 12, D, Difficult.

(1637) X CAMELOPARDALIS—*continued.*

1920						1920					
Mar						May					
17	2401	90	Wh	=e	10·1	14	2459	90	Wh	k (1) v (2) l	11·9
17	2401	,,	Bh	d+1, e+4	9·7	15	2460	80	AB	k−1, l+2·5	11·9
18	2402	50	Bn	c (3) v (1) c′	9·1	16	2461	,,	,,	l+3	12·0
18	2402	30	D	c−7, d+3	9·4	17	2462	90	Bh	k+1	11·6
18	2402	50	Tm	d (1) v (9) f	9·9	19	2464	120	Bn	g (1) v (2) h	11·2
18	2402	62	Th	=d	9·8*b*	21	2466	90	Bh	g−2, k+4	11·3
19	2403	80	AB	e+1	10·0	22	2467	,,	Wh	=k	11·7
20	2404	30	Bn	c (5) v (1) c′	9·2	23	2468	50	Tm	g+0·5	11·0
20	2404	50	Tm	d (1) v (1) e	10·0	23	2468	120	Bn	f (2) v (1) g	10·9
21	2405	90	Wh	=e	10·1	23	2468	64	Ad	=g	11·1
21	2405	25	AB	e−2·5, f+1·5	10·4	24	2469	,,	,,	g (1) v (4) k	11·2
22	2406	50	Bn	d+1·5	9·6	26	2471	80	AB	g−3, h+3	11·3
22	2406	30	D	d−1, e+3	9·9	29	2474	120	Bn	e (1) v (2) f	10·3
22	2406	50	Tm	=e	10·1	June					
23	2407	,,	,,	e (1) v (1) f	10·4	1	2477	64	Ad	d (2) v (1) e	10·0
27	2411	25	AB	f−2·5, g+2	10·9	2	2478	45	Bh	d+1	9·7
30	2414	60	D	e−4, f+1	10·5*b*	4	2480	90	,,	c−4, d+7	9·1
31	2415	90	Bh	e−5, g+5	10·6	4	2480	,,	Wh	=d	9·8
31	2415	50	Tm	g+1	11·0	6	2482	64	Ad	b (2) v (1) d	9·4
Apr						6	2482	50	Bn	c (4) v (1) c′	9·2
6	2421	,,	,,	g−2	11·3*b*	6	2482	25	AB	c−6·5, e+2	9·7*b*
6	2421	60	D	g−3, k+3	11·4	7	2483	,,	,,	c−5, e+4	9·5
6	2421	25	AB	h−2, l+3·5	11·8	7	2483	90	Wh	b (1) v (3) e	8·9
7	2422	,,	,,	k−1, l+2·5	11·9	8	2484	,,	Bh	b−1, c+1	8·6
10	2425	90	Bh	<k	<11·7	8	2484	30	D	c (1) v (3) d, c−3	9·0
11	2426	80	AB	k−2, l+1	12·0	9	2485	,,	Bn	c (3) v (1) c′	9·1
11	2426	60	D	k−3, l+4	11·9*b*	11	2487	,,	D	c−1·5	8·9
12	2427	50	Tm	k (1) v (2) l	11·9	15	2491	,,	,,	c−2·5	9·0*b*
12	2427	90	Bh	k−5, l+1	12·2	15	2491	45	Bh	b+6	7·9
16	2431	50	Tm	k (2) v (1) l	12·1	18	2494	90	,,	b+8, c+10	7·7
16	2431	60	D	k−4, l+2	12·1	19	2495	25	Ad	b+2	8·3
16	2431	90	Bh	k−4, l+2	12·1	19	2495	30	Bn	a (3) v (1) b	8·3
17	2432	,,	,,	k−3, l+3	12·0	19	2495	25	AB	b+3, c+2	8·4
17	2432	,,	Wh	k (2) v (1) l	12·1	20	2496	,,	,,	b+3·5	8·2
19	2434	50	Tm	k (3) v (1) l	12·1	20	2496	90	Wh	b+3	8·2
21	2436	120	Bn	l−2	12·5	22	2498	30	D	a−6, c+3	8·4*b*
21	2436	50	Tm	k (4) v (1) l	12·2*b*	22	2498	25	AB	b+3·5	8·2
21	2436	90	Bh	k−5, l+1	12·2	23	2499	,,	Ad	b+3	8·2*b*
21	2436	62	Th	=l	12·3	29	2505	90	Bh	b+7	7·8
25	2440	50	Tm	=l	12·3*c*	30	2506	30	D	a−3, c+6	8·1*b*
27	2442	90	Bh	l−2	12·5	July					
29	2444	,,	Wh	k (2) v (1) l	12·1*b*	7	2513	90	Bh	b+5	8·0
May						8	2514	30	D	a−3	8·1*b*
2	2447	50	Tm	k (2) v (1) l	12·1*b*	9	2515	,,	,,	a−4, c+5	8·2
4	2449	120	Bn	l−1	12·4*b*	10	2516	25	AB	b+2·5, c+1	8·4
4	2449	90	Bh	l+1	12·2	10	2516	90	Bh	b+5	8·0
4	2449	,,	Wh	k (1) v (1) l	12·0*b*	11	2517	30	D	a−6, c+4	8·4*b*
5	2450	80	AB	m−1, n+2·5	12·6*b*	13	2519	25	AB	b+3, c+1	8·4
7	2452	120	Bn	k (3) v (1) l	12·1	15	2521	30	Bn	a (3) v (2) b	8·2
7	2452	90	Bh	l+1	12·2	16	2522	80	AB	b+3, c+2	8·4
7	2452	50	Tm	k (3) v (1) l	12·1	18	2524	30	D	c+2	8·5
9	2454	80	AB	l−5, m+1·5	12·6	18	2524	90	Wh	c−2	8·9
9	2454	60	D	k−3, l+4	11·9	20	2526	25	AB	b+2, c+1	8·5
9	2454	90	Wh	l+2	12·1	21	2527	30	D	c+1·5	8·6
10	2455	50	Tm	k (2) v (3) l	11·9	24	2530	25	Ad	=b	8·5
12	2457	60	D	k−4, l+3	12·0	24	2530	30	Bn	a (4) v (1) b	8·4
12	2457	50	Tm	k (1) v (1) l	12·0	24	2530	90	Bh	b+2	8·3
12	2457	90	Bh	k−2	11·9	27	2533	,,	,,	=b	8·5
13	2458	,,	,,	k−1	11·8	30	2536	,,	,,	b−1, c+1	8·6
13	2458	120	Bn	h (2) v (1) k	11·6	Aug					
13	2458	157	Th	k+4	11·3*b*	1	2538	30	D	=c	8·7*b*
14	2459	60	D	k−3, l+3	12·0	2	2539	80	AB	c−3, e+5·5	9·3

April 10, Not seen.
April 11, D, Difficult.
April 21, Bn, t.
May 2, Glimpsed during lunar eclipse.

June 8, Bh, Yellow.
June 30, Difficult.
July 30, Yellow.
Aug. 1, About. Difficult.

(1637) X CAMELOPARDALIS—*continued.*

1920					
Aug					
6	2543	80	AB	c−4, e+5	9·4
6	2543	90	Bh	c−3, d+8	9·0
7	2544	30	D	c−6, d+4	9·3
8	2545	90	Wh	e+3	9·8
8	2545	80	AB	c−6·5, e+3·5	9·6
12	2549	25	,,	e+3	9·8
13	2550	45	Bh	d+3, e+6	9·5
13	2550	90	Wh	=d	9·8
15	2552	25	Ad	c (1) v (1) d	9·2*b*
16	2553	30	D	c−8, d+2	9·5
18	2555	90	Bh	d+2, e+5	9·6
19	2556	30	Bn	d (2) v (1) e	10·0*b*
20	2557	90	Bh	d−1, e+2	9·9
20	2557	25	AB	e−4, f+1·5	10·5*b*
22	2559	64	Ad	e (1) v (1) f	10·4*b*
22	2559	75	Bn	d (4) v (1) e	10·1
22	2559	90	Wh	=e	10·1
29	2566	,,	Bh	g−3, k+3	11·4
31	2568	25	AB	g−3, h+2	11·3*b*
Sept					
4	2572	90	Bh	k−1, l+5	11·8
5	2573	50	Tm	g+1	11·0
5	2573	25	AB	h−3, k+1·5	11·7*b*
6	2574	50	Tm	=g	11·1
7	2575	120	Bn	g (3) v (2) k	11·4
8	2576	60	D	g−3, k+3	11·4*b*
8	2576	50	Tm	=g	11·1
8	2576	90	Wh	=k	11·7
9	2577	25	AB	=k	11·7*b*
10	2578	64	Ad	k (1) v (2) l	11·9*b*
10	2578	90	Bh	k−3, l+3	12·0*b*
11	2579	80	AB	l−1, m+5·5	12·2
12	2580	,,	,,	l−3, m+5	12·3
12	2580	120	Bn	g (4) v (1) k	11·6
13	2581	90	Bh	k−1	11·8
14	2582	80	AB	l−2·5, m+5	12·3
16	2584	64	Ad	k (1) v (1) l	12·0
16	2584	90	Bh	k−3, l+3	12·0
16	2584	50	Tm	g (1) v (1) l	11·7
18	2586	95	Bn	h−2, k+0·5	11·7
19	2587	80	AB	l−2, m+4	12·3
19	2587	90	Wh	=l	12·3
22	2590	,,	Bh	k−4, l+2	12·1
22	2590	80	AB	l−3	12·6*c*
25	2593	90	Bh	k+1, l+7	11·6
27	2595	,,	,,	g−5, k+1	11·6
29	2597	,,	,,	k+2	11·5
Oct					
2	2600	120	Bn	g−4, k+2	11·5
2	2600	90	Bh	f−4, g+1	11·0
2	2600	50	Tm	g−1	11·2
3	2601	80	AB	k−2, l+2	12·0
4	2602	30	D	g−1	11·2*b*
6	2604	50	Tm	e (2) v (1) g, =f	10·7
6	2604	90	Bh	f−2, g+3	10·8
8	2606	60	D	f−3, g+2	10·9
9	2607	64	Ad	d (4) v (1) f	10·5*b*
9	2607	45	Bh	e−4, f+1	10·5*b*
9	2607	50	Tm	=f	10·6
10	2608	,,	Bn	f (1) v (1) g	10·9
11	2609	30	D	f−2, g+2	10·9
11	2609	50	Tm	d (1) v (2) e	9·9

1920					
Oct					
12	2610	90	Bh	e−2, f+3	10·
13	2611	120	Bn	e (1) v (2) f	10·
13	2611	80	AB	f−4, g+3	10·
15	2613	,,	,,	f−1, g+5·5	10·
18	2616	50	Bn	d (1) v (1) e	10·
18	2616	90	Bh	=d, e+3	9·
18	2616	30	D	d−2, e+2	10·
20	2618	,,	,,	e+1	10·
20	2618	75	Bn	d (1) v (1) e	10·
20	2618	64	Ad	=d	9·
22	2620	90	Bh	d+3	9·
22	2620	80	AB	e+1	10·
23	2621	64	Ad	c (9) v (1) d	9·
24	2622	,,	,,	c (5) v (1) d	9·
24	2622	70	Bn	d+1	9·
25	2623	90	Bh	d+5	9·
26	2624	64	Ad	c (4) v (1) d, c (3) v (1) d	9·
29	2627	80	AB	b−5·5, e+3·5	9·
29	2627	45	Bh	b−4, d+9	8·
30	2628	50	Bn	c′ (1) v (3) d	9·
31	2629	25	AB	b−4, e+4·5	9·
Nov					
1	2630	30	Bn	c′+1	9·
1	2630	90	Bh	=b, c+2	8·
1	2630	30	D	c−6, d+4	9·
4	2633	,,	Bn	c (2) v (1) c′	9·
4	2633	25	AB	b−3, d+4	9·
5	2634	45	Bh	=b	8·
6	2635	25	AB	b−2	8·
8	2637	90	Bh	b+4	8·
10	2639	,,	,,	b+4	8·
11	2640	50	Bn	b+2	8·
13	2642	25	AB	b+3, c+2	8·
15	2644	90	Bh	b+5	8·
18	2647	,,	,,	b+5	8·
18	2647	30	D	a−6·5, c+2·5	8·
18	2647	25	AB	b+4, c+3	8·
20	2649	45	Bh	b+6	7·
21	2650	30	Bn	=a	7·
21	2650	25	Ad	b+2	8·
22	2651	,,	AB	b+5, c+4	8·
30	2659	90	Bh	b+8, c+10	7·
Dec					
1	2660	50	Tm	b+2	8·
1	2660	30	Bn	a (1) v (2) b	8·
1	2660	25	AB	b+3·5, c+3	8·
4	2663	50	Tm	b+1	8·
5	2664	90	Bh	b+8	7·
8	2667	,,	,,	b+8	7·
9	2668	30	Bn	a (3) v (1) b	8·
10	2669	90	Bh	b+5	8·
12	2671	,,,	,,	b+3	8·
14	2673	50	Tm	=b	8·
17	2676	90	Bh	b−2, =c	8·
20	2679	80	AB	b+1	8·
21	2680	90	Bh	b−3, c−1	8·
26	2685	150	,,	c−4, e+9	9·
28	2687	90	,,	d+2, e+5	9·
28	2687	64	Ad	c (4) v (1) d	9·
28	2687	75	Bn	d (1) v (2) e	9·
1921					
Jan					
1	2691	80	AB	e (5) v (1) f	10·
2	2692	90	Bh	d+1, e+4	9·
6	2696	,,	,,	e+3	9·
6	2696	80	AB	=g, h+5	11·
7	2697	64	Ad	=k	11·

Sept. 7, t.
Sept. 8, D, Difficult.
Sept. 12, Bn, t.
Sept. 13, Red.

(1637) X CAMELOPARDALIS—*continued.*

1921					
an					
11	2701	64	Ad	k (3) v (1) l	12·1*b*
13	2703	90	Bh	e−3, f+2	10·4
14	2704	75	Bn	g (3) v (1) k	11·5
23	2713	150	Ad	k−4	12·1*c*
24	2714	90	Bh	f−8, k+3	11·4
29	2719	80	AB	m−2	12·7
30	2720	90	Bh	k−2, l+4	11·9
31	2721	80	AB	<m	<12·5
31	2721	120	Bn	l−1	12·4*b*
eb					
2	2723	90	Bh	l−1	12·4
3	2724	80	AB	<m	<12·5
9	2730	90	Bh	l−1	12·4
12	2733	80	AB	m−4	12·9
14	2735	90	Bh	l−3	12·6
14	2735	120	Bn	l (1) v (3) m	12·3
15	2736	80	AB	<m	<12·5*b*
20	2741	90	Bh	k−5, l+1	12·2*b*
24	2745	25	AB	l (5) v (1) m	12·5*b*
25	2746	90	Bh	k−4, l+2	12·1
26	2747	120	Bn	k (1) v (1) l	12·0
28	2749	25	AB	<l	<12·3*c*
lar					
2	2751	50	Bn	h (1) v (1) k	11·6
2	2751	90	Bh	k−1	11·8
3	2752	80	AB	l (4) v (3) m	12·4
6	2755	90	Bh	g−2, k+4	11·3
8	2757	25	AB	h (3) v (3) l	11·9
10	2759	90	Bh	e−8, g+2	10·9
10	2759	50	Bn	f (2) v (1) g	10·9
11	2760	25	AB	g (3) v (3) h	11·3
16	2765	90	Bh	=e	10·1
17	2766	45	,,	e+2	9·9
18	2767	50	Bn	e (1) v (1) f	10·4
19	2768	80	AB	e (4) v (3) g	10·7
21	2770	45	Bh	=d, e+3	9·8
23	2772	80	AB	e−2	10·3
24	2773	90	Bh	d+3	9·5
24	2773	50	Bn	c′−2, d+3	9·5
26	2775	30	,,	c′+1	9·2
29	2778	90	Bh	b−1, c+1	8·6
30	2779	50	Bn	c (4) v (1) c′	9·2
pr					
1	2781	90	Bh	b−1, c+1	8·6
1	2781	80	AB	b−3, c (4) v (6) e	9·1
3	2783	30	D	c−7, d+3	9·4
4	2784	,,	Bn	c−1	8·8
5	2785	25	AB	b−2, c−3	8·9
7	2787	30	Bn	b (5) v (2) c	8·7
7	2787	90	Bh	b+3	8·2
7	2787	30	D	c−4, d+6	9·1
8	2788	25	AB	b−2, c−4	8·9
12	2792	30	Bn	=b	8·5
12	2792	90	Bh	b+5	8·0
15	2795	,,	,,	b+3	8·2
15	2795	30	D	c−1	8·8
19	2799	90	Bh	b+3	8·2
23	2803	,,	,,	b+2	8·3
23	2803	30	Bn	a (2) v (1) b	8·3
27	2807	,,	,,	=b	8·5
28	2808	,,	D	c−1	8·8
28	2808	90	Bh	b+1	8·4*b*
29	2809	25	AB	b (3) v (5) e	9·1

Jan. 31, AB, Feb. 3, Not seen.
Feb. 12, Just seen.
Feb. 15, 28, Not seen.

1921					
Apr					
30	2810	50	Bn	=b	8·5
30	2810	90	Bh	b+1	8·4
May					
1	2811	45	,,	=b, c+2	8·5
1	2811	30	D	c−1	8·8
6	2816	25	AB	b (5) v (4) e	9·4
7	2817	90	Bh	b+1	8·4*b*
8	2818	50	Bn	c−3	9·0
9	2819	90	Bh	=b, c+2	8·5
15	2825	,,	,,	c−4, e+10	9·1
19	2829	50	Bn	d+2	9·6*b*
20	2830	90	Bh	c−7, e+7	9·4
22	2832	50	Bn	=d	9·8
23	2833	45	Bh	=e	10·1
28	2838	30	D	e−5, g+3	10·7*b*
31	2841	,,	,,	f−3, g+2	10·9
31	2841	25	AB	h (3) v (3) k	11·6
June					
2	2843	90	Bh	e−3	10·4
6	2847	120	Bn	g (5) v (1) h	11·4
6	2847	30	D	=k	11·7*b*
10	2851	90	Bh	e−5, g+5	10·6*b*
11	2852	120	Bn	h (3) v (1) k	11·6
16	2857	90	Bh	e−8, g+2	10·9
21	2862	,,	,,	=g	11·1
23	2864	120	Bn	l−1	12·4
27	2868	90	Bh	g−3, k+3	11·4
29	2870	120	Bn	l (1) v (2) m	12·4
July					
2	2873	90	Bh	g−8, l+4	11·9*b*
4	2875	,,	,,	k−4, l+2	12·1
9	2880	120	Bn	l−1	12·4
9	2880	80	AB	=m	12·5*b*
9	2880	30	D	<k	<11·7
11	2882	90	Bh	=l	12·3
23	2894	80	AB	h−2	11·7
25	2896	64	Ad	g (1) v (3) k	11·2
25	2896	60	D	f−3, g+1	11·0*c*
26	2897	120	Bn	f (2) v (1) g	10·9
26	2897	80	AB	=h	11·5
26	2897	90	Bh	k−1, l+5	11·8
29	2900	,,	,,	k+3	11·4
29	2900	25	AB	g (3) v (1) h	11·4
30	2901	60	D	f−1, g+3	10·8*b*
31	2902	64	Ad	=f	10·6*b*
31	2902	25	AB	g (1) v (4) h	11·1
Aug					
1	2903	60	D	d−6, e−3, f+2·5	10·4*b*
3	2905	,,	,,	e−3, f+2	10·4*b*
3	2905	64	Ad	=f	10·6*b*
4	2906	25	AB	f (4) v (1) g	11·0
6	2908	,,	,,	f (3) v (3) g	10·9
6	2908	90	Bh	g+1, k+7	11·0
7	2909	,,	,,	e−8, g+2	10·9
8	2910	64	Ad	e (1) v (3) f	10·3
9	2911	75	Bn	d (4) v (1) e	10·1
11	2913	30	D	e−1, f+3	10·3
12	2914	90	Bh	d−1, e+2	9·9
15	2917	,,	,,	b−10, d+3	9·5
19	2921	,,	,,	c−4, e+10	9·1
24	2926	60	D	c−2, d+8	8·9*b*
25	2927	90	Bh	=c	8·7

June 6, D, About. Difficult.
July 25, D, Difficult.
July 30, Difficult.
Aug. 24, Difficult.

(1637) X CAMELOPARDALIS—*continued.*

1921						1921					
Aug						Oct					
25	2927	30	Bn	c−1	8·8*b*	31	2994	80	Ca	f−6, h+3	11
26	2928	,,	D	c+2	8·5	Nov					
27	2929	,,	,,	a (2) v (1) c, c+4	8·4*b*	6	3000	120	Bn	k (5) v (2) l	12
28	2930	,,	,,	a (3) v (1) c, c+3	8·5	7	3001	90	Bh	k−1	11
29	2931	90	Bh	b−1	8·6*b*	12	3006	,,	,,	k−5, l+1	12
30	2932	,,	,,	b+2	8·3	18	3012	80	AB	m−3	12
30	2932	30	D	a−3, c+7	8·1	20	3014	90	Bh	k−7, l−1	12
30	2932	25	AB	b+3, c+2	8·4	21	3015	80	Ca	<l	<12
31	2933	30	D	a−6, c+3	8·4	22	3016	,,	AB	m−3	12
Sept						23	3017	82	Ad	l−2·5	12
1	2934	25	AB	b+4, c+2	8·3	24	3018	90	Bh	l−4	12
2	2935	30	Bn	b+1·5	8·4	26	3020	,,	,,	l−3	12
2	2935	,,	D	a−6, c+4	8·4	26	3020	120	Bn	l−3	12
4	2937	90	Bh	b+2	8·3	29	3023	90	Bh	l−2	12
5	2938	,,	,,	b+1	8·4	Dec					
5	2938	30	Bn	a (3) v (2) b	8·2	3	3027	,,	,,	l−1	12
5	2938	,,	D	a−4, c+6	8·2	15	3039	,,	,,	k+2	11
6	2939	25	AB	c+3	8·4	17	3041	64	Ad	e (4) v (1) g,	10
7	2940	,,	,,	b+4, c+3	8·3					f (2) v (3) g	
7	2940	30	D	a−5, c+5	8·3	20	3044	90	Bh	d−2, e+1	10
7	2940	25	Ad	b+2	8·3*b*	21	3045	80	AB	f (4) v (1) g	11
8	2941	,,	,,	b+1	8·4	22	3046	50	Bn	e (2) v (1) f	10
8	2941	30	Bn	a (2) v (1) b	8·3	23	3047	90	Bh	=d	9
10	2943	,,	,,	a (1) v (2) b	8·0	25	3049	,,	,,	d+2, e+5	9
10	2943	90	Bh	b+2	8·3	25	3049	75	Bn	e (3) v (2) f	10
12	2945	25	Ad	b+2	8·3	29	3053	,,	,,	d (2) v (1) e	10
14	2947	30	D	c+3	8·4	29	3053	90	Bh	b−6, c−4	9
15	2948	25	Ad	b+2	8·3*b*	30	3054	,,	,,	c−2	8
15	2948	30	Bn	a (2) v (1) b	8·3	1922					
16	2949	90	Bh	b+6, c+10	7·8	Jan					
21	2954	30	Bn	a (2) v (1) b	8·3	1	3056	,,	,,	=d	9
21	2954	,,	D	a−6, c+3·5	8·4*b*	3	3058	30	Bn	d+3	9
22	2955	25	Ad	b+2	8·3	4	3059	,,	D	c (3) v (1) d, d+3	9
22	2955	,,	AB	b+4, c+3	8·3	4	3059	90	Wh	d+3	9
24	2957	90	Bh	b+4, c+6	8·1	8	3063	,,	Bh	c−6, d+5	9
24	2957	30	D	a−7, c+3	8·5	10	3065	30	Bn	c (4) v (1) c′	9
25	2958	25	Ad	b+1	8·4	18	3073	90	Bh	=b	8
25	2958	30	Bn	a (4) v (1) b	8·4	20	3075	,,	,,	b−1, c+1	8
26	2959	25	AB	b+3, c+2	8·4	20	3075	30	Bn	b−3	8
27	2960	50	Bn	b+2	8·3	29	3084	45	Bh	=b, c+2	8
27	2960	30	D	c+1	8·6	Feb					
28	2961	,,	,,	=b, c+2	8·5	2	3088	90	Bh	b+2	8
30	2963	25	Ad	=b	8·5*b*	5	3091	,,	,,	b+2	8
30	2963	,,	AB	=b, c−2	8·7	9	3095	25	Bn	a (1) v (2) b	8
30	2963	90	Bh	=b, c+2	8·5	10	3096	90	Bh	b+2	8
Oct						11	3097	25	Bn	a (1) v (2) b	8
1	2964	50	Bn	b (2) v (1) c	8·6	13	3099	90	Wh	b−2	8
1	2964	30	D	c−2	8·9	17	3103	30	Bn	a (3) v (1) b	8
1	2964	25	Ad	=b	8·5	17	3103	90	Bh	b+2	8
4	2967	,,	,,	=c	8·7*b*	20	3106	,,	,,	b+1	8
5	2968	50	Bn	b (1) v (4) d	8·8	23	3109	32	Ca	b−1, c+1	8
5	2968	25	AB	c (4) v (4) e	9·4	24	3110	25	Bn	a (3) v (1) b	8
5	2968	90	Bh	b−1, c+1	8·6	26	3112	90	Wh	=c	8
5	2968	30	D	c−4, d+6	9·1	26	3112	,,	Bh	b−2, =c	8
8	2971	50	Bn	c (2) v (1) d	9·4	28	3114	,,	,,	c−1, d+10	8
8	2971	90	Bh	=c	8·7*b*	Mar					
9	2972	45	,,	c−3, d+7, e+10	9·1	2	3116	30	Bn	c−1	8
9	2972	25	Ad	c (1) v (3) d	9·0	4	3118	90	Bh	c−4, e+10	8
14	2977	,,	,,	=e	10·1*c*	7	3121	30	Bn	c (4) v (1) c′	8
14	2977	50	Bn	=d	9·8	9	3123	25	,,	c′+2	8
16	2979	90	Bh	=e	10·1*b*	16	3130	32	Ca	d−2, e+1	1
18	2981	80	AB	f (2) v (5) h	10·9	16	3130	45	Bh	=e	1
23	2986	45	Bh	e−3	10·4	17	3131	90	,,	e−2	1
23	2986	50	Bn	f (1) v (2) g	10·8	19	3133	,,	,,	e−3	1
26	2989	80	AB	=h	11·5	20	3134	50	Bn	f (1) v (2) g	1
27	2990	90	Bh	g+2	10·9	22	3136	90	Wh	=g	1
31	2994	,,	,,	=g	11·1	22	3136	,,	Bh	e−5, g+5	1
31	2994	80	AB	l−1	12·4	24	3138	80	Ca	g−1, h+3	1

(1637) X CAMELOPARDALIS—*continued.*

922						1922					
ar						Aug					
7	3141	50	Bn	f (3) v (1) g	11·0	25	3292	75	Bn	h (3) v (1) k	11·6
8	3142	90	Bh	g+1	11·0	26	3293	64	Ad	k−1	11·8*b*
1	3145	150	,,	g−4, k+2	11·5	31	3298	90	Bh	k−4, l+2	12·1
pr						Sept					
4	3149	120	Bn	k+1	11·6	4	3302	,,	,,	k−3, l+3	12·0*b*
9	3154	150	Bh	l+2	12·1	7	3305	,,	,,	k−4, l+2	12·1*b*
0	3155	90	Wh	k (1) v (1) l	12·0	11	3309	64	Ad	k (2) v (1) l	12·1
4	3159	,,	Bh	=l	12·3	11	3309	85	Bn	<k	<11·7
7	3162	,,	,,	l−1	12·4	15	3313	90	Bh	k−2, l+4	11·9
8	3163	,,	,,	l−1	12·4	18	3316	64	Ad	k−1	11·8*c*
8	3163	,,	Wh	l+3	12·0	20	3318	30	Co	g−5	11·6*b*
2	3167	85	Bn	k (1) v (1) l	12·0*b*	20	3318	120	Bn	h−2, k+1	11·6
3	3168	90	Bh	k−3, l+3	12·0	21	3319	90	Bh	k+1	11·6
9	3174	120	Bn	=h, k+1·5	11·5*b*	24	3322	30	Co	g−3	11·4
9	3174	90	Bh	k+2	11·5	24	3322	64	Ad	=k	11·7
0	3175	,,	,,	g−3, k+3	11·4	26	3324	90	Bh	g−3, k+3	11·4
ay						28	3326	31	D	f−1, g+2	10·8*b*
2	3177	,,	,,	g+1	11·0	29	3327	50	Bn	f (1) v (2) g	10·8
4	3179	50	Bn	g−3, =h	11·4	Oct					
6	3181	90	Bh	e−4, g+6	10·5	2	3330	90	Bh	e−2, g+8	10·3
8	3183	45	,,	e−1	10·2	4	3332	,,	,,	e+1	10·0
3	3188	50	Bn	e (3) v (1) f	10·5	6	3334	,,	,,	d−2, e+1	10·0
7	3192	45	Bh	e+1	10·0	6	3334	50	Bn	d (3) v (2) e	10·0
0	3195	,,	,,	d−1, e+2	9·9	7	3335	90	Bh	d−1, e+2	9·9
1	3196	,,	,,	d+1, e+4	9·7	11	3339	30	Co	d+1	9·7
1	3196	31	D	e−1, f+4	10·2	11	3339	90	Bh	c−4, e+10	9·1
3	3198	50	Bn	d+1	9·7	12	3340	32	Ca	c−4, d+7	9·1
6	3201	45	Bh	c−6, e+8	9·3	12	3340	50	Bn	b−6, c′+1	9·1
7	3202	25	Ad	c (1) v (5) d	8·9	13	3341	31	D	c−7, d+3·5	9·4
8	3203	,,	,,	b (1) v (4) d	8·8*b*	13	3341	25	Ad	b (4) v (3) e	9·4*b*
8	3203	31	D	c−4, d+6	9·1	13	3341	90	Bh	b−2, =c	8·7
ne						13	3341	30	Co	d+2	9·6
4	3210	50	Bn	b (2) v (1) c	8·6	14	3342	,,	,,	c−3·5	9·1
4	3210	90	Bh	b−1, c+1	8·6	14	3342	90	Bh	b−1, c+1	8·6
6	3212	25	Ad	b+2, =c	8·5	14	3342	64	Ad	b (2) v (1) e	9·6
0	3216	90	Bh	=b	8·5*b*	15	3343	50	Bn	b (5) v (4) c′	8·9
1	3217	25	Ad	b+2	8·3	16	3344	30	Co	c (1) v (1) d	9·2
2	3218	45	Bh	b+1, c+3	8·4	18	3346	90	Bh	b−2, =c	8·7
5	3221	,,	,,	b+4, c+6	8·1	21	3349	,,	,,	=b, c+2	8·5
9	3225	,,	,,	b+6, c+8	7·9	22	3350	25	Ad	b (1) v (4) e	8·8
6	3232	90	,,	b+7	7·8	22	3350	30	Bn	b (1) v (3) c′	8·7
9	3235	45	,,	b+7	7·8	22	3350	,,	Co	c (1) v (2) d	9·1
ly						24	3352	50	Bn	b−1	8·6
2	3238	45	Bh	b+7	7·8	25	3353	25	Ad	b−1	8·6
0	3246	,,	,,	b+6	7·9	25	3353	90	Bh	=b	8·5
4	3250	,,	,,	b+4, c+6	8·1	27	3355	,,	,,	b+1	8·4
6	3252	,,	,,	b+1	8·4	27	3355	30	Co	c−1	8·8
9	3255	50	Bn	=b	8·5	28	3356	50	Bn	b (1) v (5) c′	8·6
0	3256	25	Ad	=b	8·5	28	3356	32	Ca	=c	8·7
0	3256	45	Bh	b−2, =c	8·7	30	3358	30	Co	c−1	8·8*b*
7	3263	,,	,,	b−3, c−1	8·8						
0	3266	50	Bn	d+2	9·6	Nov					
1	3267	25	Ad	b (2) v (1) d	9·3	1	3360	50	Bn	b+1	8·4
1	3267	45	Bh	c−6, d+5	9·3*b*	4	3363	25	,,	a (3) v (1) b	8·3
ig						4	3363	,,	Ad	b+2·5	8·3*b*
5	3272	90	,,	e−2	10·3	4	3363	90	Bh	b+2	8·3
7	3274	64	Ad	e (1) v (1) f	10·4*b*	9	3368	,,	,,	b+2	8·3
2	3279	90	Bh	e−5, g+5	10·6	9	3368	30	Co	c+3	8·4
5	3282	64	Ad	f (1) v (1) g	10·9*b*	11	3370	90	Bh	b+2	8·3
8	3285	90	Bh	g−3, k+3	11·4	13	3372	50	Bn	a (1) v (2) b	8·0
0	3287	75	Bn	g−1	11·2	13	3372	30	Co	c+3·5	8·4*b*
0	3287	64	Ad	=h	11·5*b*	14	3373	90	Bh	b+1, c+3	8·4
3	3290	,,	,,	=k	11·7	14	3373	32	Ca	b+5	8·0
3	3290	90	Bh	k+1	11·6	15	3374	30	Bn	a (1) v (3) b	8·0
5	3292	,,	,,	k−1, l+5	11·8	15	3374	31	D	a (4) v (1) c, c+3	8·5

April 29, Bn, t.

Sept. 11, Bn, Not seen.

(1637) X CAMELOPARDALIS—*continued.*

1922 Nov					
15	3374	30	Co	c+3·5	8·4
18	3377	,,	,,	c+3·5	8·4
18	3377	25	Bn	a (1) v (3) b	8·0
19	3378	90	Bh	=b	8·5
21	3380	45	,,	b−1, c+1	8·6b
23	3382	30	Co	c+2	8·5
24	3383	32	Ca	b+5	8·0
24	3383	30	Bn	a (1) v (2) b	8·0
24	3383	90	Bh	b+5	8·0
27	3386	25	Bn	a (1) v (1) b	8·2
28	3387	90	Bh	b+6, c+8	7·9
Dec					
1	3390	,,	,,	b+6, c+8	7·9
6	3395	45	,,	b+3	8·2
6	3395	25	Bn	a (3) v (1) b	8·3
6	3395	30	Co	=c	8·7
8	3397	,,	,,	c−1·5	8·9
11	3400	90	Bh	=b	8·5
13	3402	32	Ca	=c	8·7
16	3405	90	Bh	b−3, c−1	8·8
17	3406	30	Co	c (1) v (1) d	9·2b
18	3407	90	Bh	b−5, c−3	9·0
19	3408	30	Co	d+2	9·6
19	3408	50	Bn	b (5) v (3) c	9·0
20	3409	31	D	c−7, d+3	9·4
22	3411	30	Co	=d	9·8
24	3413	75	Bn	d (2) v (1) e	10·0
24	3413	30	Co	=e	10·1
25	3414	90	Bh	d+3, e+6	9·5b
26	3415	30	Co	=e	10·1
27	3416	75	Bn	e (2) v (1) f	10·5
1923 Jan					
4	3424	,,	,,	f (3) v (1) g	11·0
4	3424	90	Bh	d−5, e−2	10·3
6	3426	,,	,,	e−6	10·7
8	3428	75	Bn	g−1	11·2
9	3429	94	Li	g (8) v (2) h	11·4
11	3431	90	Bh	k−1	11·8
14	3434	,,	,,	k−3	12·0
14	3434	120	Bn	k (2) v (1) l	12·1
17	3437	32	Ca	<l	<12·3
20	3440	90	Bh	−l	12·3
20	3440	120	Bn	l−2	12·5
24	3444	,,	,,	l (3) v (1) m	12·5
27	3447	90	Bh	l−3	12·6
30	3450	,,	,,	l−5	12·8
Feb					
3	3454	,,	,,	k−10, l−4	12·7
4	3455	120	Bn	m−2	12·7
8	3459	90	Bh	k−2, l+4	11·9
11	3462	120	Bn	l−4, m−1	12·7
16	3467	90	Bh	g−4, k+2	11·5
17	3468	32	Ca	<l	<12·3
21	3472	110	Rd	h (4) v (1) l	12·1
23	3474	45	Bh	g−2, k+4	11·3
25	3476	90	,,	g−1, k+5	11·2
Mar					
2	3481	,,	,,	e−1	10·2
3	3482	32	Ca	d (2) v (1) e	10·0
5	3484	90	Wh	−e	10·1
5	3484	,,	Bh	e+1	10·0
6	3485	50	Bn	e (1) v (2) f	10·3

Jan. 14, 20, Bn, t.
Jan. 17, Invisible.
Feb. 17, Glimpsed.

1923 Mar					
8	3487	90	Bh	d+5	
13	3492	,,	,,	−b	
16	3495	32	Ca	c−1	
17	3496	90	Wh	b (1) v (1) c	
17	3496	,,	Bh	b+2	
17	3496	30	Co	c (1) v (1) d	
17	3496	50	Bn	b−2, c+5	
21	3500	90	Bh	b+1	
24	3503	30	Co	−c	
24	3503	50	Bn	b+1	
25	3504	90	Wh	b (1) v (2) c	
25	3504	,,	Bh	b+1	
26	3505	31	D	c (1) v (1) d, e−2	
26	3505	30	Co	=c	
28	3507	,,	,,	c−1	
31	3510	90	Bh	b+4	
Apr					
3	3513	110	Rd	b (1) v (4) e, c (1) v (10) d	
3	3513	30	Co	c−1	
4	3514	32	Ca	b+1	
4	3514	50	Bn	a (2) v (1) b	
7	3517	,,	,,	a (2) v (1) b	
8	3518	31	D	c−1	
9	3519	50	Bn	a (3) v (1) b	
9	3519	90	Bh	b+4, c+6	
13	3523	,,	,,	b+3	
13	3523	30	Bn	b+1	
14	3524	90	Wh	−b	
14	3524	30	Co	c−1	
17	3527	32	Ca	b+1	
19	3529	34	Li	a (8) v (2) b	
19	3529	30	Co	c−1·5	
20	3530	,,	D	−c	
20	3530	30	Bn	a (3) v (1) b	
23	3533	90	Bh	−b	
24	3534	30	Bn	a (3) v (1) b	
26	3536	,,	,,	a (4) v (1) b	
May					
3	3543	,,	Co	c (1) v (1) d	
3	3543	90	Wh	b (2) v (1) e	
3	3543	,,	Bh	b+1	
4	3544	30	Bn	b (1) v (1) c	
5	3545	90	D	c−5, d+5	
7	3547	90	Wh	=d	
9	3549	,,	Bh	c−5, e+10	
10	3550	30	D	d+1	
11	3551	,,	Co	=d	
13	3553	,,	D	d+1	
13	3553	32	Ca	=d	
17	3557	110	Rd	d (3) v (2) e	
17	3557	45	Bh	d−2, e+1	
17	3557	50	Bn	c (1) v (3) f	
21	3561	,,	,,	e (2) v (1) f	
25	3565	120	,,	f (3) v (2) g	
30	3570	90	Bh	k+3	
June					
2	3573	,,	,,	=k	
2	3573	,,	Wh	k (2) v (1) l	
11	3582	,,	,,	−k	<11
11	3582	110	Rd	g (4) v (1) l	
21	3592	90	Bh	k−10, l−4	
23	3594	,,	,,	k−10	
23	3594	,,	Wh	<k	<11

May 5, 3[6].
June 11, 23, Wh, Invisible.

(1637) X CAMELOPARDALIS—*continued.*

23					
ily					
1	3602	90	Bh	=k	11·7*b*
4	3605	120	Bn	g (4) v (1) k, h−1	11·6
5	3606	90	Bh	g−2, k+4	11·3*b*
7	3608	,,	Wh	k (1) v (2) l	11·9
8	3609	120	Bn	f−4, g+0·5	11·0
2	3613	30	D	f−2, g+2	10·9
4	3615	90	Bh	e−5, g+5	10·6*b*
0	3621	30	D	=e	10·1
5	3626	50	Bn	c′ (3) v (2) d	9·6
1g					
1	3633	90	Bh	=c	8·7*b*
3	3635	,,	,,	c−1	8·8
3	3635	,,	Wh	=b	8·5
4	3636	50	Bn	b (1) v (3) c′	8·7
0	3638	120	Ga	b−2, =c	8·7
8	3640	50	Bn	b+2	8·3
9	3641	90	Bh	b+4	8·1
9	3641	,,	Wh	b+2	8·3
3	3645	25	Bn	a (1) v (1) b	8·2
5	3647	,,	,,	a (1) v (2) b	8·0
5	3647	90	Bh	b+6	7·9
8	3650	,,	,,	b+5	8·0
8	3650	25	Bn	a (1) v (4) b	7·9
2	3654	90	Bh	b+8	7·7
4	3656	25	Bn	a (1) v (3) b	8·0
8	3660	,,	,,	a (1) v (1) b	8·2
0	3662	90	Wh	=b	8·5
0	3662	,,	Bh	b+5	8·0
pt					
1	3664	30	D	a−5, b+3	8·3*b*
2	3665	90	Bh	b+5	8·0
4	3667	,,	Wh	b+2	8·3
5	3668	30	Bn	a (3) v (1) b	8·3
7	3670	90	Bh	b+6	7·9
8	3671	25	Bn	a (3) v (1) b	8·3
0	3673	90	Bh	b+4	8·1
0	3673	,,	Wh	=c	8·7
1	3674	30	D	b+2	8·3
1	3674	25	Bn	a (5) v (1) b	8·4
5	3678	90	Bh	b+1	8·4
5	3678	50	Bn	b−1	8·6
6	3679	60	Ga	=b, c+2	8·5
8	3681	30	D	=b	8·5
21	3684	,,	Co	c−3	9·6
21	3684	90	Bh	b−1, c+1	8·6
21	3684	25	Bn	b+2, =c, c′+6	8·7
22	3685	90	Wh	b (2) v (1) c	9·6
26	3689	,,	Bh	c−2	8·9
28	3691	,,	Wh	=d	9·8
28	3691	30	Co	c−3	9·0
30	3693	,,	D	c−1, f+5	10·2
30	3693	80	Rd	d (5) v (5) f, e (1) v (9) g	10·2
30	3693	90	Bh	c+7, e+7	9·4
Oct					
4	3697	,,	,,	e−4, g+6	10·5
4	3697	50	Bn	e (2) v (3) f	10·3
4	3697	90	Wh	=f	10·6
7	3700	,,	Bh	e−8, g+2	10·9
9	3702	,,	,,	g−1	11·2
9	3702	60	Ga	=f, g+5	10·6
11	3704	90	Bh	g−4, k+2	11·5
14	3707	80	Rd	k (1) v (4) l	11·8*b*
14	3707	120	Bn	k+1	11·6

Sept. 1, Difficult.
Sept. 16, Oct. 9, Ga, T.

1923					
Oct					
17	3710	120	D	k−2	11·9
17	3710	32	Ca	h (1) v (1) k	11·6
17	3710	90	Wh	g (2) v (1) k	11·5
17	3710	,,	Bh	k−4, l+2	12·1
20	3713	,,	,,	l+1	12·4
23	3716	,,	,,	l+1	12·2
23	3716	120	Bn	k (3) v (1) l	12·1
26	3719	90	Bh	l−1	12·4
28	3721	120	Bn	k−4, l+2	12·1
29	3722	90	Wh	l−3	12·6
29	3722	,,	Bh	l−2	12·5
Nov					
1	3725	150	,,	l−1	12·4
2	3726	120	D	k−4, l+1	12·1*b*
3	3727	90	Bh	k−6, =l	12·3*b*
4	3728	120	Bn	l−2	12·5
7	3731	,,	,,	=l	12·3
7	3731	80	Rd	k (9) v (1) l	12·2*b*
7	3731	60	D	<l	12·3
7	3731	150	Bh	l−1	12·4
10	3734	90	,,	k−4, l+2	12·1
10	3734	120	Bn	k (3) v (1) l	12·1
10	3734	80	Rd	l−2	12·5
14	3738	,,	,,	l−1	12·4
14	3738	120	Bn	k (2) v (1) l	12·1
16	3740	,,	,,	k (2) v (1) l	12·1
17	3741	90	Bh	k−3, l+4	11·9
23	3747	,,	,,	=k	11·7
30	3754	,,	,,	k+1	11·6
30	3754	120	Bn	g (1) v (1) k	11·4
Dec					
2	3756	90	Bh	k+2	11·5
2	3756	120	Bn	g (1) v (1) k	11·4
4	3758	,,	,,	g (1) v (3) k	11·2
4	3758	90	Bh	k+3	11·4
8	3762	,,	,,	=g, k+6	11·1
8	3762	32	Ca	f (4) v (1) g	11·0
9	3763	30	D	f−3, g+2	10·9
13	3767	32	Ca	f (2) v (3) g	10·8
15	3769	30	Co	e−1·5	10·3
15	3769	90	Wh	e (1) v (1) f	10·4
15	3769	120	Bn	e (2) v (1) f	10·5
16	3770	80	Rd	d (3) v (2) f e (2) v (3) g	10·4
18	3772	50	Bn	d (2) v (1) e	10·0
18	3772	45	Bh	d−2, e+1	10·0
18	3772	30	Co	e+3	9·8
20	3774	50	Bn	d+1	9·7
22	3776	45	Bh	d+2, e+5	9·6*b*
23	3777	50	Bn	=c′, d+3	9·4
24	3778	30	Co	=d	9·8
24	3778	90	Bh	e−4, d+7	9·1
28	3782	,,	,,	b−4, c−2, d+9	8·9
28	3782	30	Co	e−2·5	9·0
28	3782	90	Wh	c−2	8·9
30	3784	30	D	c−2	8·9
31	3785	32	Ca	c−1	8·8
1924					
Jan					
2	3787	50	Bn	c−1	8·8
3	3788	90	Bh	b+1	8·4
3	3788	,,	Wh	b+3	8·2
4	3789	30	Co	c+1	8·6
5	3790	,,	D	b−2	8·7

Nov. 2, Difficult.
Nov. 7, D, No trace of X.

(1637) X CAMELOPARDALIS—*continued.*

1924						
Jan						
5	3790	...	Rd	b (1) v (9) e, b (2) v (3) c	8·6	
5	3790	90	Bh	b+3	8·2	
6	3791	50	Bn	b+2, c+4	8·3	
6	3791	32	Ca	b+2	8·3	
6	3791	30	Co	c+3	8·4	
6	3791	,,	D	b+1	8·4	
7	3792	,,	,,	a (4) v (1) b, b+3	8·3	
7	3792	90	Bh	b+5	8·0	
11	3796	45	,,	b+5	8·0	
12	3797	30	D	a (3) v (1) b, b+4	8·3*b*	
14	3799	,,	Co	c+2·5	8·5	
14	3799	25	Bn	a (2) v (5) b	8·0	
15	3800	30	D	a (1) v (2) b, a−5	8·1	
16	3801	90	Bh	b+5	8·0	
20	3805	,,	,,	b+6	7·9	
23	3808	,,	,,	b+6	7·9	
25	3810	,,	,,	b+5	8·0	
25	3810	25	Bn	a−3, b+4	8·1	
25	3810	30	Co	a−3, c+4	8·2*b*	
27	3812	,,	,,	a−3, c+3	8·3	
27	3812	,,	D	a (4) v (1) b, b+3	8·3	
29	3814	25	Bn	a−3, b+4	8·1	
29	3814	...	Rd	b (1) v (4) c	8·5	
31	3816	90	Bh	b+6	7·9	
Feb						
1	3817	30	Bn	a−4, b+3	8·2	
1	3817	,,	Co	=c	8·7	
1	3817	,,	D	b+1	8·4	
4	3820	90	Bh	b+5	8·0	
5	3821	32	Ca	b−1	8·6	
8	3824	30	D	b (1) v (4) d, b−3	8·8	
8	3824	,,	Co	c (2) v (2) d	9·2	
8	3824	...	Rd	b (2) v (3) e, c (2) v (3) d	9·1	
11	3827	45	Bh	b−1, c+1	8·6	
14	3830	60	D	b (3) v (1) d, d+3	9·5	
14	3830	90	Wh	=d	9·8	
16	3832	30	Co	d+2·5	9·5	
16	3832	25	Bn	b−4, c−6, c′+4	9·0	
18	3834	45	Bh	d+2, e+5	9·6	
20	3836	50	Bn	d+2	9·6	
21	3837	90	Bh	d−1, e+2	9·9	
23	3839	32	Ca	d (2) v (1) e	10·0	
23	3839	90	Wh	=e	10·1	
24	3840	50	Bn	d (4) v (1) e	10·1	
24	3840	90	Bh	e−2	10·3	
26	3842	,,	,,	d−2, e−1	10·1	
26	3842	50	Bn	f+1	10·5	
28	3844	30	Co	f−5, g+3	11·0	
Mar						
1	3846	45	Bh	e−3	10·4	
2	3847	50	Bn	f (3) v (1) g	11·0	
4	3849	90	Bh	e−8, h+6	10·9	
4	3849	,,	Wh	k+1	11·6	
7	3852	120	Bn	g (4) v (1) k	11·6	
7	3852	32	Ca	k (1) v (5) l	11·8	
7	3852	90	Bh	g−2, k+4	11·3	
9	3854	,,	,,	k−1, l+5	11·8	
9	3854	120	D	k−3, l+3	12·0*b*	
9	3854	...	Rd	g (3) v (2) l, k (2) v (3) l	11·9	

Jan. 7, D, 4c.
Jan. 12, 5c.
Feb. 1, 8, D, 5c.
Feb. 14, D, 4c.

1924						
Mar						
10	3855	90	Wh	=k		1
10	3855	120	Bn	k (1) v (1) l		1
11	3856	90	Bh	k−3, l+3		1
15	3860	150	,,	l+1		1
19	3864	90	,,	l−1		1
19	3864	120	Bn	<k		<1
22	3867	90	Bh	l−2		1
26	3871	,,	,,	l−3		1
29	3874	,,	,,	l−3		1
29	3874	120	Bn	l−4		1
30	3875	...	Rd	l−3		1
Apr						
1	3877	120	Bn	l−5, m−2		1
1	3877	...	Rd	l−5		1
2	3878	150	Bh	l−5		1
4	3880	90	,,	l−5		1
4	3880	120	Bn	m−2·5		1
6	3882	90	Bh	l−4		1
7	3883	120	Bn	l−6		1
8	3884	90	Bh	l−5		1
9	3885	120	Bn	l−6. m−3		1
11	3887	90	Bh	<l		<1
14	3890	120	Bn	l−4		1
16	3892	90	Bh	k−3, l+3		1
20	3896	,,	,,	l−1		1
20	3896	120	Bn	l−3		1
25	3901	90	Bh	k−4, l+2		1
27	3903	,,	Wh	k (1) v (1) l		1
30	3906	,,	Bh	g (1) v (1) l, =k		1
May						
1	3907	50	Bn	f (4) v (1) g		1
3	3909	90	Bh	g−3, k+3		1
4	3910	60	D	g−2, k+4		1
5	3911	...	Rd	f (3) v (2) h, g (1) v (4) k		1
5	3911	50	Bn	f (1) v (1) g		1
5	3911	45	Bh	g−1, k+5		1
7	3913	60	D	=g		1
9	3915	,,	,,	f−2, g+2		1
13	3919	,,	,,	e−1, f+4		1
13	3919	90	Bh	d−1, e+1		1
16	3922	45	,,	d+2		
16	3922	50	Bn	c (4) v (1) c′		
19	3925	,,	,,	c (3) v (2) c′		
21	3927	60	D	c−7, d+4		
22	3928	90	Bh	=b		
23	3929	60	D	c (2) v (1) d, d+4		
25	3931	,,	,,	c−6, d+4		
26	3932	90	Bh	b+1		
27	3933	60	D	c−3, d+7		
27	3933	...	Rd	b (1) v (4) d		
27	3933	90	Wh	=b		
27	3933	50	Bn	c−1		
28	3934	90	Bh	b+1		
30	3936	60	D	c−5, d+5		
31	3937	90	Bh	b+1		
June						
1	3938	60	D	c (1) v (4) d, c−2		
4	3941	90	Bh	b+2		

Mar. 9, D, Difficult.
Mar. 19, Bn, Not seen.
April 11, Not seen.
May 25, 5c.
May 30, 4c.
June 1, 5c.

(1637) X CAMELOPARDALIS—*continued.*

1924					
June					
5	3942	60	D	=b	8·5
10	3947	90	Bh	b+1	8·4
11	3948	60	D	b+1	8·4
13	3950	25	Bn	a (4) v (1) b	8·4
13	3950	45	Bh	b+1	8·4
18	3955	,,	,,	b+1	8·4
20	3957	50	Bn	b+1	8·4
21	3958	90	Wh	b+3	8·2
22	3959	60	D	b+1	8·4
24	3961	90	Bh	b−1	8·6
25	3962	...	Rd	b (1) v (9) d	8·6
26	3963	60	D	b+2	8·3
28	3965	90	Bh	b−2, =c	8·7
29	3966	60	D	b (1) v (4) d, b−2	8·7
30	3967	45	Bh	b−3, c−1	8·8
July					
4	3971	90	,,	b−3, c−1	8·8
6	3973	60	D	b−7, d+3	9·3
9	3976	,,	,,	b−7, d+3	9·3
9	3976	90	Bh	b−6, d+7	9·1
10	3977	50	Bn	c′−2, d+2	9·5
14	3981	,,	,,	d+1·5	9·6
14	3981	60	D	d+1	9·7
14	3981	90	Bh	d−1, e+2	9·9
19	3986	,,	,,	d−1, e+2	9·9
19	3986	50	Bn	d (2) v (1) e	10·0
24	3991	,,	,,	d (5) v (1) e	10·1
24	3991	90	Bh	e+1	10·0
26	3993	,,	,,	e−2	10·3
29	3996	,,	,,	e−3	10·4
29	3996	50	Bn	e (3) v (1) f	10·5
31	3998	60	D	f−2, g+2	10·9
Aug					
2	4000	90	Bh	e (4) v (1) g	10·9
5	4003	120	Bn	g (2) v (1) k	11·5
7	4005	90	Bh	g−3, k+3	11·4
8	4006	60	D	g−1·5, k+5	11·2
12	4010	120	Bn	k+1	11·6
15	4013	90	Bh	=k	11·7
17	4015	120	D	k−3, l+2	12·0
19	4017	90	Bh	k (1) v (1) l	12·0
19	4017	120	Bn	k (1) v (2) l	11·9
22	4020	90	Bh	l−1	12·4
25	4023	,,	,,	l−2	12·5
27	4025	,,	,,	l−1	12·4
27	4025	60	D	k−5, l+1	12·2
31	4029	75	Bn	k (4) v (1) l	12·2
31	4029	90	Bh	=l	12·3
Sept					
2	4031	,,	,,	k (1) v (1) l	12·0*b*
5	4034	,,	,,	l+1	12·2
8	4037	120	Bn	k (5) v (2) l	12·1
16	4045	90	Bh	k−1	11·8
19	4048	60	D	g−2, k+4	11·3
22	4051	90	Bh	k+1	11·6
22	4051	60	D	f−2·5, g+1·5	10·9
22	4051	50	Bn	f (3) v (1) g	11·0
1924					
Sept					
23	4052	...	Rd	f (2) v (3) g	10·8*b*
24	4053	50	Bn	f−3, g+1	11·0
25	4054	90	Bh	g (1) v (2) k	11·3
27	4056	,,	,,	e (3) v (2) g	10·7
27	4056	50	Bn	e (2) v (1) f	10·5
29	4058	90	Bh	e+1	10·0
Oct					
1	4060	,,	,,	d−1, e+2	9·9
1	4060	,,	Wh	=e	10·1
5	4064	32	Ca	d (1) v (2) e	9·9
6	4065	90	Wh	b (3) v (1) d	9·5
11	4070	,,	Bh	b (1) v (1) c	8·6
12	4071	50	Bn	b+1	8·4
14	4073	90	Bh	b+1	8·4
23	4082	,,	,,	b+2	8·3
23	4082	25	Bn	a (3) v (1) b	8·3
25	4084	32	Ca	=a	7·8
27	4086	90	Wh	=b	8·5
31	4090	,,	,,	=b	8·5
31	4090	,,	Bh	b+4	8·1
Nov					
3	4093	,,	,,	b+5	8·0
3	4093	34	Li	=a	7·8
3	4093	25	Bn	a−3, b+3	8·2
5	4095	90	Bh	b+5	8·0
6	4096	34	Li	=a	7·8
8	4098	45	Bh	b+5	8·0
10	4100	,,	,,	b+6	7·9
15	4105	90	,,	b+3	8·2
15	4105	,,	Wh	b (1) v (2) e	9·0
19	4109	45	Bh	b (1) v (1) c	8·6
21	4111	90	Wh	b (1) v (1) e	9·3
24	4114	45	Bh	=b	8·5
27	4117	90	,,	c−3	9·0
27	4117	...	Rd	b (3) v (2) e, c (7) v (3) d	9·5
27	4117	50	Bn	c (1) v (1) c′	9·0
30	4120	,,	,,	c−4	9·1
30	4120	60	D	b−1	8·6
Dec					
2	4122	90	Bh	c−5, e+10	9·2
4	4124	32	Ca	c (5) v (6) d	9·2
5	4125	...	Rd	b (5) v (5) e, d (1) v (9) f	9·6*b*
5	4125	50	Bn	c (7) v (3) d	9·5
6	4126	90	Bh	c (2) v (1) d	9·4
6	4126	44	Li	c (2) v (8) d	8·9*b*
9	4129	,,	,,	c (9) v (1) d	9·7*b*
12	4132	90	Wh	=d	9·8
14	4134	50	Bn	d (3) v (2) e	10·0
14	4134	90	Bh	=d	9·8
19	4139	,,	,,	e−1	10·2
21	4141	32	Ca	d (7) v (1) f	10·5
24	4144	40	D	g+1	11·0
24	4144	90	Wh	=g	11·1
24	4144	,,	Bh	e−7, g+3	10·8
26	4146	,,	,,	g+1	11·0
26	4146	,,	Wh	=g	11·1
28	4148	120	Bn	f (3) v (1) g	11·0
30	4150	90	Bh	=g	11·1*b*
30	4150	...	Rd	g (2) v (3) k	11·3

June 5, 4[c].
June 11, 22, 26, 5[c].

(8600) R CASSIOPEIÆ. (V. 1.)

H.D. 235350.

Star S unindentified, estimated $12^{m}\cdot3$, $\Delta\alpha-10^{s}$, $\Delta\delta-0''\cdot4$.

Date.	Julian Date.	Inst.	Observer.	Comparisons.	Deduced Mag.
1920					
Jan					
1	2325	240	Br	58−1	12·5
1	2325	150	Bh	58−2	12·6*b*
1	2325	296	Th	58−8	13·2*b*
8	2332	...	Hw	=58	12·4*b*
8	2332	90	Bh	=w	12·8*b*
14	2338	55	Bo	58 (1) v (3) w	12·5
15	2339	120	Br	=w	12·8
15	2339	90	Bh	58−5, w−1	12·9
16	2340	110	Bg	=58	12·4*b*
16	2340	...	Hw	<58	<12·4
19	2343	157	Th	58−4	12·8
21	2345	94	Bl	58 (4) v (1) w	12·7
21	2345	55	Bo	=w	12·8
21	2345	200	Bn	=w	12·8*b*
23	2347	90	Bh	<w	<12·8
24	2348	180	Bg	58−4, =w	12·8
24	2348	240	Br	w−2	13·0
24	2348	157	Th	w−1	12·9
Feb					
2	2357	160	Bo	=w	12·8*b*
4	2359	157	Th	w−3	13·1*b*
6	2361	240	Br	=w	12·8
6	2361	130	Bo	x (1) v (3) y	13·2
7	2362	180	Bg	w−2, x+1	13·0
8	2363	157	Th	w−2	13·0
10	2365	90	Bh	=w, =x	13·0
11	2366	200	Bn	w−3	13·1*b*
11	2366	157	Th	w−2, y+4	13·0
14	2369	94	Bl	w+0·5	12·8
15	2370	130	Bo	w (3) v (1) x	13·1
17	2372	183	Ma	S−3·5	12·7
17	2372	180	Bg	=w	12·8
19	2374	130	Bo	x (1) v (1) y	13·3
21	2376	120	Br	=w	12·8
21	2376	183	Ma	S−2	12·5
22	2377	94	Bl	58 (3·5) v (1·5) w	12·7
28	2383	160	Bo	x (3) v (1) y	13·4
Mar					
4	2388	90	Bh	58−3, =w	12·8*b*
7	2391	,,	,,	58−1	12·5
7	2391	120	Br	w+2	12·6
8	2392	160	Bo	58 (3) v (1) w	12·7
8	2392	183	Ma	S−1, 58−4	12·6
8	2392	157	Th	w−3	13·1
11	2395	183	Ma	S−1	12·4*c*
12	2396	160	Bo	58 (1) v (2) w	12·5
12	2396	90	Bh	=58	12·4
15	2399	183	Ma	=S	12·3*c*
16	2400	160	Bo	58 (1) v (1) w	12·6
18	2402	150	Bn	S (3) v (1) w	12·7*b*
18	2402	90	Bh	58+1	12
18	2402	94	Bl	57 (4) v (1) 58, =w	12
19	2403	160	Bo	58 (1) v (3) w	12
19	2403	183	Ma	S−1	12
23	2407	,,	,,	<S	<12
25	2409	90	Bh	58+2	12
30	2414	160	Bo	58 (1) v (4) w	12
Apr					
11	2426	90	Bh	52−7, 58+3	12
15	2430	94	Bl	56 (4) v (1) 57	12
17	2432	90	Bh	52−5, 58+5	11
21	2436	157	Th	57−3	12
21	2436	160	Br	57+3	11
27	2442	45	Bh	52−6, 58+3	12
May					
2	2447	180	Bg	=57	12
4	2449	94	Bl	=52	11
7	2452	160	Br	52−6, 57+2	11
7	2452	150	Bn	57 (2) v (1) 58	12
7	2452	45	Bh	52−4	11
9	2454	90	,,	52−4	11
9	2454	157	Th	52−6, 57+3	11
9	2454	90	Wh	52−3	11
12	2457	,,	Bh	52−3, 58+6	11
14	2459	,,	,,	52−3, 58+6	11
14	2459	94	Bl	52 (2) v (1) 56	11
21	2466	,,	,,	52 (3·5) v (1·5) 56	11
21	2466	120	Bn	54 (3) v (1) 57	11
22	2467	,,	Br	52−4, 57+4	11
22	2467	180	Wh	57−2	12
23	2468	90	Bh	52−5	11
23	2468	146	Th	52−2	11
29	2474	90	Bh	51−2	11
June					
2	2478	,,	,,	=51	11
4	2480	,,	,,	51−1	11
4	2480	,,	Wh	52−3	11
8	2484	,,	Bh	51+1	10
8	2484	120	Br	52+1	11
8	2484	,,	Bn	51 (3) v (1) 52	11
8	2484	94	Bl	30 (6) v (2) 43	10
9	2485	120	D	52+2	11
15	2491	90	Bh	=25, =26, 30+2	9
18	2494	,,	,,	=21	9
19	2495	45	Br	13−1, 16+1	8
19	2495	120	Bn	30+1	9
20	2496	90	Wh	=30	9
22	2498	30	D	15−5, 21+1	9
23	2499	90	Bh	12−5, =16, 21+5	8
23	2499	55	Bg	16−1, 21+4	9
25	2501	13	Mn	10−4	8
29	2505	45	Br	6−4, 8+1	7

Jan. 1, Th, 12½-in. spec.
Jan. 23, Not seen.
Feb. 17, Ma, Occasionally glimpsed.
Mar. 15, Glimpsed.

Mar. 18, Bl, Uncertain.
June 15, 18, Orange.

(8600) R CASSIOPEIÆ—*continued.*

1920					
June					
29	2505	45	Bh	6−3, 8+1, 10+5	7·5
30	2506	30	D	9−2, 15+4	8·4*b*
30	2506	22	Bl	8 (3) v (3) 10	7·9
July					
3	2509	F	Mn	=10	8·0*b*
3	2509	30	Bg	8−4, =11, 12+4	8·1
6	2512	45	Bh	6−2	7·4
8	2514	30	Bg	8−2, 11+2	7·9
8	2514	,,	D	5−4, 9+3	7·9
10	2516	45	Bh	6−1	7·3
11	2517	30	D	5−5, 9+3	7·9
11	2517	43	Gi	6−2, 9+3	7·6
13	2519	,,	,,	5−1, 9+2·5	7·8
13	2519	30	Bg	8−1, 11+3	7·8*b*
14	2520	22	Bl	3 (3·5) v (1·5) 6	7·0
14	2520	B	Mn	6 (2) v (1) 8	7·5
14	2520	30	D	5−3, 9+5	7·7
14	2520	,,	Bn	6 (1) v (1) 7	7·3
15	2521	45	Bh	6−3	7·5*b*
17	2523	B	Mn	=8	7·7
17	2523	45	Br	4−1, 6+1	7·1
18	2524	30	Bn	6 (1) v (1) 7	7·3
18	2524	90	Wh	3 (1) v (1) 4	6·8
19	2525	30	D	5−4, 9+3	7·9
19	2525	45	Bh	=3	6·7
20	2526	43	Gi	5−1, 9+2·5	7·8
21	2527	30	D	5−4, 9+3	7·9*b*
24	2530	22	Bl	4 (3·5) v (1·5) 5	7·3
24	2530	B	Mn	4 (2) v (1) 6	7·1
24	2530	30	Bn	6 (1) v (1) 7	7·3
24	2530	90	Bh	6+3	6·9
26	2532	45	Br	4−0·5, 6+1	7·0
27	2533	50	Ma	5 (1) v (2) 9	7·7
28	2534	43	Gi	5−1, 9+4	7·7
30	2536	45	Bh	3+1	6·6
31	2537	55	Bg	6−4, 8+1	7·6
Aug					
1	2538	B	Mn	6−1	7·3*b*
2	2539	43	Gi	=5	7·5*b*
3	2540	30	D	6−6, 5−2, 9+5	7·7*b*
5	2542	48	Bg	8−1, 11+3	7·8
5	2542	50	Ma	=9, 18+10	8·1
6	2543	45	Bh	3−1	6·8
7	2544	30	Bn	4 (2) v (1) 6	7·1
7	2544	,,	D	5−3, 9+5	7·7*b*
8	2545	45	Br	6+2	7·0
8	2545	90	Wh	=3	6·7*b*
10	2547	30	D	5−4, 9+4	7·8*b*
11	2548	50	Ma	5 (1) v (1) 9	7·8*b*
12	2549	43	Gi	5−1·5	7·7*b*
12	2549	22	Bl	4 (1) v (4) 6	7·0
13	2550	B	Mn	7 (2) v (1) 8	7·6
13	2550	45	Bh	3−2, 6+2	6·9
14	2551	30	Bn	6 (1) v (1) 7	7·3*b*
15	2552	,,	Bg	8−3, 11+1	8·0
16	2553	,,	D	5−5, 9+2	8·0
17	2554	55	Bo	4 (3) v (1) 6	7·1
18	2555	45	Bh	3−2, 6+3	6·9
19	2556	,,	Br	=6	7·2
19	2556	30	Bn	6 (2) v (1) 7	7·3

1920					
Aug					
20	2557	28	Ma	6−1	7·3
20	2557	B	Mn	8 (1) v (3) 10	7·8
22	2559	43	Gi	5−3, 9+4	7·8*b*
23	2560	22	Bl	=7	7·4
26	2563	55	Bg	11−1, 12+3	8·2
26	2563	30	Bn	8 (3) v (1) 10	7·9
26	2563	B	Mn	8 (2) v (1) 10	7·9
29	2566	45	Bh	=6	7·2
31	2568	50	Ma	=9	8·2*b*
Sept					
4	2572	B	Mn	10−1	8·1
5	2573	30	Bn	7 (3) v (1) 9, 8−4, 10+1	8·0
5	2573	43	Gi	5−6, 9+2	8·0*b*
6	2574	90	Bh	6−2	7·4
8	2576	30	D	9−3, 15+3	8·5
8	2576	23	Bo	8 (3) v (1) 10	7·9
10	2578	45	Br	=8	7·7
10	2578	,,	Bh	6−2, 5+1, 10+6	7·4
10	2578	...	Hw	8 (5) v (5) 13	8·2
10	2578	B	Mn	11−1	8·2*b*
10	2578	90	Wh	=15	8·8
11	2579	50	Ma	=14, 18+2·5, 25+2·5	8·9*b*
12	2580	23	Bo	8 (1) v (2) 10	7·8
12	2580	30	Bn	7 (5) v (1) 9, 8 (4) v (1) 10	8·0
13	2581	90	Bh	6−3, 10+5	7·5
16	2584	45	,,	4−5, 6−3, =5	7·5
16	2584	B	Mn	11 (3) v (1) 17, =15	8·7*b*
16	2584	22	Bl	8 (4) v (2) 10	7·9
18	2586	B	Mn	13 (2) v (1) 15	8·7
18	2586	55	Bg	12−1, 16+3	8·6
18	2586	30	Bn	9 (1) v (3) 12, =10	8·2
19	2587	23	Bo	10 (1) v (3) 12	8·1
19	2587	90	Wh	=18	9·0
20	2588	45	Br	8−1, 13+5	8·0
25	2593	90	Bh	10−3, 14+5	8·3*b*
27	2595	55	Bg	16−1, 21+4	9·0
27	2595	...	Hw	8 (6) v (4) 16	8·4*b*
27	2595	32	Mn	11−1, 12+3	8·2*b*
28	2596	22	Bl	=10	8·0
29	2597	23	Bo	15 (1) v (1) 16	8·9*b*
29	2597	90	Bh	6−1, 8−4, 14+7	8·1
30	2598	75	Gi	9−2, 15+3	8·4
Oct					
2	2600	45	Bh	6−9, 8−5	8·1
4	2602	23	Bo	11 (3) v (1) 12	8·4
4	2602	22	Bl	16+0·5	8·9*b*
6	2604	55	Bg	16−2, 21+3	9·1
6	2604	45	Br	=13	8·6
6	2604	90	Bh	10−2, 14+6	8·2
6	2604	32	Mn	=12	8·5*b*
8	2606	...	Hw	=18	9·0
9	2607	23	Bo	13 (3) v (1) 16	8·8
9	2607	50	Bn	12 (3) v (1) 14	8·7
11	2609	30	D	=21	9·4
11	2609	50	Ma	18+2, 25+1	9·1
12	2610	90	Bh	10−4, 14+4	8·4
13	2611	32	Mn	13 (1) v (3) 18	8·7*b*
14	2612	94	Bl	16 (4·5) v (1·5) 21	9·3

June 30, D, Difficult.
July 6, 10, Orange.
July 24, Bh, With 45, 7·0.
July 27, Reddish orange.
Aug. 5, Ma, Pale red.
Aug. 11, Reddish.
Aug. 31, Pale red.
Sept. 10, Br, About.
Sept. 29, Bo, Doubtful.
Sept. 30, Aperture reduced to 4 in.
Oct. 4, Bl, Difficult.
Oct. 11, Ma, Deep crimson.

(8600) R CASSIOPEIÆ—*continued.*

1920						1921					
Oct						Jan					
14	2612	23	Bo	13 (2) v (1) 15	8·7	2	2692	90	Bh	52+1	11·
15	2613	75	Gi	9—6, 15+2	8·7	5	2695	94	Bl	52+0·5	11·
18	2616	90	Bh	16+2, 18+4	8·7	6	2696	90	Bh	=52	11·
19	2617	55	Bo	16 (1) v (1) 18	9·0	7	2697	79	Ma	52—2	11·
19	2617	,,	Bg	21—1, 30+4	9·5	8	2698	160	Bo	52 (1) v (3) 54	11·
19	2617	...	Hw	=21	9·4*b*	11	2701	,,	Br	52—4, 57+4	11·
20	2618	32	Mn	13 (1) v (3) 15	8·7	12	2702	32	Mn	52—2	11·
20	2618	45	Br	13—1, 16+1	8·8	13	2703	90	Bh	52—2, 58+8	11·
24	2622	50	Bn	18 (3) v (1) 21	9·3	14	2704	94	Bl	51 (1) v (2) 52, =51	11·
25	2623	90	Bh	21+6	8·8	14	2704	79	Ma	52—4·5	11·
26	2624	23	Bo	16 (3) v (1) 18	9·0	15	2705	183	,,	52—2·5	11·
28	2626	...	Hw	=21	9·4*b*	15	2705	40	Hw	=52	11·
28	2626	32	Mn	18 (3) v (2) 21	9·2	15	2705	120	Bn	52 (3) v (1) 57	11·
28	2626	22	Bl	17 (3·5) v (1·5) 21	9·3	16	2706	160	Bo	52 (3) v (1) 54	11·
29	2627	55	Bg	21—2, 30+3	9·6	24	2714	90	Bh	52—5, 58+5	11·
30	2628	,,	Bo	18 (1) v (3) 20	9·1	25	2715	117	Gi	52—2, 8+3	11·
30	2628	90	Bh	21+5	8·9	27	2717	160	Bo	57 (1) v (3) 58	12·
Nov						29	2719	,,	Br	57+1	12·
1	2630	120	Bn	=21	9·4	31	2721	94	Bl	=56	11·
3	2632	32	Mn	18 (3) v (1) 21	9·3*b*	31	2721	150	Bn	58 (1) v (2) w	12·
5	2634	45	Br	18—1, 21+3	9·1	31	2721	160	Bo	57 (1) v (3) 58	12·
6	2635	105	Bo	30 (1) v (3) 32	9·9*b*	Feb					
7	2636	22	Bl	21 (2) v (4) 30	9·6	2	2723	32	Mn	=52	11·
10	2639	150	Bh	18—1, 21+3	9·1	2	2723	40	Hw	=58	12·
10	2639	117	Gi	21—0·5, 30+2	9·6	2	2723	90	Bh	52—6, 58+3	12·
12	2641	55	Bg	=30	9·9*b*	3	2724	120	Br	57—1, 58+1	12·
12	2641	79	Ma	21 (1) v (3) 43	9·7	4	2725	183	Ma	52—10, 58+2	12·
13	2642	90	Hw	=30	9·9	5	2726	160	Bo	57 (1) v (1) 58	12·
16	2645	55	Bo	21 (1) v (1) 30	9·7	9	2730	183	Ma	=58	12·
16	2645	150	Bh	18—2, 21+2	9·2	9	2730	90	Bh	58+1	12·
16	2645	120	Bn	30 (1) v (1) 43	10·2	13	2734	117	Gi	57+1, 58+2	12·
16	2645	79	Ma	21 (2) v (1) 30	9·8	17	2738	183	Ma	=58	12·
18	2647	160	Br	21—4, 30+2	9·8	19	2740	94	Bl	58+0·5	12·
18	2647	30	D	30—1	10·0*b*	19	2740	160	Bo	58 (1) v (1) w	12·
18	2647	32	Mn	=21	9·4*b*	20	2741	130	Mn	58—1	12·
19	2648	94	Bl	21 (1) v (4) 30	9·5	24	2745	94	Bl	57 (3) v (1) 58	12·
20	2649	90	Hw	=30	9·9	24	2745	160	Bo	58 (1) v (1) w	12·
20	2649	55	Bo	18 (3) v (1) 21	9·3	25	2746	120	Br	58—2, w+2	12·
21	2650	90	Bh	=21	9·4*b*	25	2746	90	Bh	=58	12·
30	2659	,,	,,	21—5	9·9	26	2747	150	Bn	58 (2) v (1) w	12·
Dec						26	2747	117	Gi	58—4, w+2·5	12·
1	2660	75	Bg	43—4, 52+4	10·9	27	2748	183	Ma	S+3, =58	12·
2	2661	117	Gi	30—1·5	10·1*b*	Mar					
2	2661	94	Bl	30 (1) v (3) 36	10·0	2	2751	,,	,,	=S	12·
3	2662	32	Mn	34 (1) v (2) 38	10·2*b*	2	2751	90	Mn	58 (1) v (1) w	12·
5	2664	90	Bh	21—10, 43+2	10·4	2	2751	100	Bg	<58	<12·
8	2667	240	Br	52+1	11·3	2	2751	150	Bn	w—1	12·
10	2669	90	Bh	51+3, 52+7	10·7	2	2751	160	Bo	58 (3) v (1) w	12·
12	2671	,,	,,	51+2	10·8	6	2755	90	Bh	58—2	12·
12	2671	55	Bo	=51	11·0	7	2756	160	Bo	w (1) v (1) x	13·
12	2671	32	Mn	37 (1) v (1) 43	10·4	10	2759	120	Br	=w	12·
14	2673	94	Bl	30 (2) v (3) 36	10·1	10	2759	40	Hw	=58	12·
17	2676	90	Bh	51+1, 52+5	10·9	12	2761	94	Bl	58 (2) v (2) w	12·
21	2680	,,	,,	=51	11·0	12	2761	160	Bo	x (1) v (3) y	13·
21	2680	,,	Hw	=52	11·4*b*	15	2764	,,	,,	x (1) v (1) y	13·
21	2680	60	Mn	=43	10·5*b*	20	2769	120	Br	=w	12·
26	2685	75	Bg	52—1, =54	11·4*b*	24	2773	90	Bh	58—5	12·
28	2687	90	Bh	51—2, 52+2	11·2	30	2779	160	Bo	x (3) v (1) y	13·
30	2689	75	Bg	54—1, 50+1	11·5*b*	31	2780	117	Gi	<58	<12·
31	2690	90	Bh	51—3, =52	11·3	Apr					
31	2690	120	Bn	52—1	11·5*b*	1	2781	90	Bh	58—2	12·

Oct. 19, Bo, With 23, 9·0.
Nov. 12, Ma, Ruddy.
Nov. 16, Ma, Red.
Nov. 19, With 22, 9·8.
Dec. 21, Mn, R fluctuating.
Dec. 31, Jan. 15, Bn, t.

Feb. 17, About.
Feb. 20, Doubtfully glimpsed.
Mar. 2, Ma, About.
Mar. 20, About.
Mar. 31, Glimpsed.

(8600) R CASSIOPEIÆ—*continued.*

1921					
Apr					
1	2781	40	Hw	<58	<12·4
2	2782	94	Bl	58 (3) v (2) w	12·6
8	2788	120	Br	=w	12·8
25	2805	90	Bh	58−3	12.7
27	2807	,,	,,	58−3	12·7
28	2808	240	Br	=w	12·8*b*
28	2808	94	Bl	58 (2) v (2) w	12·6
May					
7	2817	90	Bh	58−1	12·5
9	2819	120	Mn	58 (2) v (1) w	12·7*b*
12	2822	94	Bl	58 (4) v (1) w	12·7
15	2825	90	Bh	52−8, 58+2	12·2
20	2830	160	Bo	<58	<12·4
23	2833	90	Bh	=57	12·1*b*
24	2834	180	Bg	=57	12·1*c*
30	2840	90	Bh	52−5, 58+4	11·9
31	2841	120	D	<58	<12·4
31	2841	94	Bl	56 (3) v (1) 57	12·0
June					
1	2842	60	Mn	57 (1) v (2) 58	12·2*b*
1	2842	160	Bo	57 (1) v (1) 58	12·3
2	2843	120	Br	=58	12·4
2	2843	90	Bh	52−3, 57+5	11·6
7	2848	120	Bn	S (3) v (1) w	12·7
8	2849	117	Gi	8−3, 57+1	12·1*b*
10	2851	90	Bh	51−6	11·6
11	2852	120	Bn	=S, 58+1	12·3
11	2852	94	Bl	56 (2) v (2) 57	11·9
14	2855	160	Bo	56 (3) v (1) 57	12·0
15	2856	60	Mn	52 (1) v (3) 58, 56−0·5	11·6*b*
21	2862	117	Gi	51−1·5, 52+1	11·2
21	2862	90	Bh	51−4	11·4
23	2864	110	Bg	52−2, =56	11·6*b*
24	2865	94	Bl	51 (1) v (2) 52	11·1
27	2868	120	Br	52−4, 57+4	11·7
27	2868	90	Bh	52+1	11·3
28	2869	94	Bl	43 (4·5) v (1·5) 51	10·9
29	2870	120	Bn	57 (1) v (3) 58	12·2
29	2870	,,	D	<52	<11·4
30	2871	60	Mn	52 (1) v (2) 57	11·6*b*
30	2871	90	Bh	51−2, 52+2	11·2*b*
July					
1	2872	117	Gi	=53	11·3*b*
4	2875	90	Bh	51−2, 52+2	11·2
5	2876	110	Bg	52−1, 56+1	11·5
7	2878	90	Bh	=51	11·0
8	2879	120	Bn	54 (2) v (1) 57	11·9
8	2879	94	Bl	43 (1) v (5) 52	10·6
9	2880	120	D	52 (2) v (1) 58	12·1*b*
11	2882	90	Bh	51+2	10·8
13	2884	117	Gi	43−2·5, 51+2	10·8*b*
21	2892	183	Ma	52−3	11·7
21	2892	75	Bg	=52	11·4*b*
25	2896	120	D	52+2	11·2*b*
26	2897	,,	Bn	52 (1) v (1) 54	11·4*b*
26	2897	90	Bh	51+1	10·9
28	2899	75	Gi	30−4·5, 43+1·5	10·4
29	2900	90	Bh	51+2, 52+5	10·8
30	2901	94	Bl	30 (5) v (2) 43	10·3
31	2902	75	Bg	51−2, 52+1·5	11·2
31	2902	120	Br	=52	11·4
1921					
July					
31	2902	120	D	52+1	11·3*b*
31	2902	90	Mn	30 (2) v (1) 51	10·6*b*
Aug					
6	2908	,,	Bh	21−8, 30−2	10·2
7	2909	117	Gi	30−2, 43+3·5	10·1
8	2910	75	Bg	43−2, 51+3	10·7
9	2911	85	Bn	30 (1) v (3) 43	10·1
9	2911	79	Ma	21−3, 52+2	10·4
9	2911	90	Mn	21 (5) v (4) 30	9·7
10	2912	45	Bh	21−5, =30	9·9*b*
14	2916	,,	,,	18−5, 21−1, 30+5	9·5
17	2919	90	,,	=18	9·0
18	2920	55	Bo	13 (1) v (1) 15	8·7
18	2920	75	Bg	=21	9·4
19	2921	90	Bh	18+3, 21+6	8·8
22	2924	45	,,	18+6, 21+10	8·4
23	2925	22	Bl	=10	8·0
24	2926	55	Bo	10 (2) v (1) 13	8·4
24	2926	30	D	9−5, 15+1	8·7*b*
25	2927	50	Ma	18+6	8·4
25	2927	55	Bg	16+2	8·7*b*
26	2928	30	D	9−4, 15+3	8·5
28	2930	,,	,,	9−2, 15+5	8·3
29	2931	45	Bh	6−2	7·4
29	2931	47	Gi	5−5, 9+4	7·9*b*
30	2932	45	Br	6−2, 8+4	7·3*b*
31	2933	F	Bo	7 (1) v (3) 8	7·5
Sept					
2	2935	30	D	6−5, 5+2, 9+5	7·5*b*
4	2937	45	Bh	=3, 6+1	6·9
5	2938	,,	,,	6+2	7·0
5	2938	55	Bo	4 (1) v (2) 6	7·0
5	2938	22	Bl	=3	6·7
5	2938	30	Bn	4 (1) v (1) 6	7·1
7	2940	,,	,,	3 (2) v (1) 4	6·9
7	2940	,,	D	3−2, 6+3	6·9*b*
7	2940	50	Ma	6+2	7·0*b*
10	2943	30	Bn	3 (2) v (1) 4	6·9
10	2943	90	Bh	=3	6·7
12	2945	47	Gi	3−1, 6+3	6·8
12	2945	40	Hw	v (4) 4 (6) 6	6·8
14	2947	22	Bl	1 (1) v (3) 3	6·4
14	2947	30	D	3−3, 6+2	7·0*b*
15	2948	,,	Bn	3+1	6·6
16	2949	45	Bh	3+3	6·4
21	2954	22	Bl	1 (1) v (5) 3, =1	6·3
21	2954	40	Hw	=4	7·0
21	2954	30	D	3−2, 6+3	6·9
21	2954	,,	Bn	3 (1) v (3) 4	6·8
21	2954	,,	Bg	=4, 6+2	7·0
21	2954	55	Bo	1 (3) v (2) 3	6·5
23	2956	30	D	=3, 6+5	6·7
24	2957	45	Br	3+4, 4+6	6·3
24	2957	,,	Bh	3+3	6·4
25	2958	30	Bg	2−1, 4+1	6·9
25	2958	,,	Bn	3 (1) v (1) 4	6·8
26	2959	55	Bo	1 (3) v (2) 3	6·5
27	2960	30	D	1−3, 3+2	6·5
27	2960	40	Hw	=4	7·0
28	2961	F	Bg	2−1, 4+1	6·9
28	2961	45	Bh	3+3, 6+6	6·5
30	2963	,,	,,	3+4, 6+7	6·4
30	2963	30	D	1−3, 3+1	6·6

April 8, About.
April 28, Br, About.
May 24, About.
July 9, 25, Difficult.

July 31, D, Difficult.
Sept. 2, 7, D, Difficult.
Sept. 12, Gi, Aperture reduced to 4 in.

(8600) R CASSIOPEIÆ—*continued.*

1921						1921					
Oct						Dec					
1	2964	55	Bo	1 (1) v (1) 3	6·5	29	3053	90	Bh	6−1	7
1	2964	30	Bn	3 (3) v (2) 4	6·9	30	3054	75	Gi	9−2·5, 15+3·5	8
1	2964	22	Bl	1 (4·5) v (1·5) 3	6·6	1922					
2	2965	47	Gi	=3	6·7	Jan					
4	2967	F	Bg	2−1, 4+1	6·9	1	3056	45	Bh	4−6, 6−8	7
5	2968	30	Bn	3 (2) v (1) 4	6·9	4	3059	,,	Br	13+1	8
5	2968	45	Bh	3+3, 6+6	6·5	6	3061	22	Bl	=13	8
5	2968	30	D	1−4, 3+1	6·6	8	3063	90	Bh	6−10, 10−2	8
6	2969	40	Hw	=4	7·0	10	3065	,,	,,	4−6, 6−8	7
7	2970	55	Bo	1 (4) v (1) 3	6·6*b*	13	3068	75	Gi	9 (5·5) v (1·5) 15	8
8	2971	45	Bh	3+4, 6+7	6·4	16	3071	79	Ma	21+4	9
9	2972	30	D	1−6, =3, 6+6	6·7	16	3071	90	Hw	=21	9
11	2974	22	Bl	1 (1·5) v (3·5) 3	6·4	16	3071	55	Bg	21−1, 30+4	9
15	2978	47	Gi	=3	6·7	17	3072	30	Bn	14 (2) v (1) 21	9
15	2978	90	Bh	1−2, 3+2	6·5	18	3073	90	Bh	6−10, 14+5	8
15	2978	55	Bo	1 (4) v (1) 3	6·6*b*	21	3076	45	Br	18−2, 21+2	9
16	2979	F	Bg	=4	7·0	21	3076	90	Bh	10−5, 14+3	8
18	2981	40	Hw	4 (5) v (5) 6	7·1	23	3078	22	Bl	=18	9
23	2986	45	Bh	1−2, 3+2	6·5	29	3084	45	Bh	14−4, =21	9
24	2987	30	Bg	4−1, 6+1	7·1*b*	Feb					
24	2987	25	Bn	3 (3) v (1) 4	6·9	1	3087	94	Bl	18 (1) v (3) 21	9
25	2988	45	Br	4+3	6·7*b*	1	3087	90	Hw	=21	9
27	2990	22	Bl	1 (4) v (1) 3, =3	6·6	1	3087	55	Bg	21−4, 30+1	9
27	2990	45	Bh	6+5	6·7	2	3088	90	Bh	21+1	9
30	2993	25	Bn	4 (3) v (1) 6	7·1	4	3090	75	Gi	15 (4) v (2·5) 21	9
30	2993	47	Gi	3−3·5, 6+1·5	7·0	5	3091	90	Bh	=21	9
Nov						7	3093	50	Ma	21 (1) v (1) 30, =23	9
6	3000	F	Bo	3 (1) v (2) 6	6·9*b*	9	3095	,,	,,	21 (1) v (1) 30	9
6	3000	30	Bn	4 (3) v (1) 6	7·1	9	3095	55	Bg	21−4, 30+1	9
6	3000	90	Bh	6+4	6·8	13	3099	90	Wh	=30	9
7	3001	45	Br	4+2	6·8	13	3099	,,	Hw	=30	9
9	3003	22	Bl	3 (1) v (4) 6	6·8	13	3099	160	Br	30−1	10
10	3004	40	Hw	=6	7·2	17	3103	90	Bh	=28, =30	9
11	3005	55	Bo	3 (2) v (3) 6	6·9	17	3103	130	Ma	21 (1) v (1) 51	10
12	3006	45	Bh	6+2	7·0*b*	18	3104	50	Bn	30 (1) v (2) 36	10
17	3011	55	Bo	3 (3) v (2) 6	7·0	19	3105	79	Ma	21+1	9
20	3014	45	Bh	3−1, 6+3	6·8	20	3106	45	Bh	=28, =30	9
21	3015	47	Gi	5−2·5, 9+4	7·8*b*	24	3110	75	Gi	21 (2·5) v (4) 30	9
22	3016	40	Hw	6 (5) v (5) 8	7·4	24	3110	130	Ma	21 (3) v (2) 52, 21−7, 52+5	10
22	3016	55	Bg	8−2, 11+2	7·9						
22	3016	,,	Bo	6 (1) v (4) 5	7·2*b*	26	3112	90	Wh	30−3	10
23	3017	22	Bl	6 (3) v (2) 8	7·5	26	3112	,,	Bh	21−1	9
24	3018	30	D	5−3, 9+4	7·8	27	3113	94	Bl	=21	9
25	3019	45	Bh	6+2	7·0	Mar					
25	3019	55	Bo	5 (1) v (4) 9	7·6	4	3118	160	Br	30−1, 43+5	10
26	3020	50	Bn	6 (2) v (1) 7	7·3	4	3118	50	Bn	36+1	10
29	3023	45	Bh	3−3, 6+2	7·0	4	3118	90	Hw	=30	9
Dec						4	3118	,,	Bh	21−2	9
3	3027	90	,,	6+1	7·1	10	3124	,,	,,	21−4, =28, =30	9
3	3027	45	Br	6−4, 8+2	7·5	17	3131	,,	,,	21−7, 30−2	10
7	3031	30	Bg	11−1, 12+3	8·2*b*	17	3131	94	Bl	31 (1) v (6) 43	10
10	3034	47	Gi	5−2, 9+1	7·9*b*	17	3131	117	Gi	30 (3·5) v (3) 43	10
13	3037	45	Bh	=6	7·2*b*	19	3133	90	Bh	34−1	10
15	3039	90	,,	3−5, =6	7·2	28	3142	,,	,,	21−10, 43+1, 51+5	10
17	3041	55	Bo	9 (2) v (1) 15	8·6	29	3143	94	Bl	=43	10
17	3041	30	Bg	12−1, 16+3	8·6	31	3145	120	Br	52−1	11
21	3045	90	Bh	=6	7·2	31	3145	90	Bh	=51, 52+4	11
25	3049	45	Br	8−1	7·8	Apr					
25	3049	90	Bh	6−2	7·4	18	3163	,,	,,	52+1	11
28	3052	30	Bn	9 (1) v (1) 12	8·3	23	3168	,,	,,	=52	11
28	3052	,,	Bg	12−2, 16+2	8·7						

Oct. 2, Aperture reduced to 4 in.
Oct. 15, Gi, Aperture reduced to 4 in.
Nov. 7, Orange.
Nov. 25, Dec. 3, Bh, Yellow.
Dec. 15, 21, Orange.

Jan. 13, 8^c.
Jan. 16, Ma, Ruddy.
Feb. 1, Bl, With 22, 9·3*b*.
Feb. 4, 7^c.
Feb. 24, Gi, 7^c.
Feb. 27, With 22, 9·8.

(8600) R CASSIOPEIÆ—*continued.*

1922 May					
12	3187	90	Bh	52−3	11·7
12	3187	94	Bl	52 (1) v (6) 57	11·5
13	3188	120	Br	=57	12·1
20	3195	94	Bl	=57	12·1
22	3197	117	Gi	52 (3·5) v (1) s, 58+3·5	11·8*b*
25	3200	160	Br	57−1, 58+1	12·3
27	3202	90	Bh	52−5	11·9
28	3203	94	Bl	56 (4) v (1) 57	12·0
June					
12	3218	90	Bh	52−5, 58+5	11·9
15	3221	94	Bl	58−1	12·5*b*
21	3227	117	Gi	s (2) v (2) 57	12·0
29	3235	94	Bl	52 (3) v (4) 58	11·8
July					
2	3238	90	Bh	<52	<11·4
4	3240	240	Br	<52	<11·4*b*
10	3246	,,	,,	=57	12·1
10	3246	150	Bh	52−8, 58+2	12·2
20	3256	90	,,	52−5, 58+5	11·9*b*
20	3256	117	Gi	=s, 57+3·5	11·8
21	3257	120	Br	57+2	11·9
24	3260	180	Bg	56−4, 57+1	12·0*b*
27	3263	90	Bh	52−7, 58+3	12·1
30	3266	120	Bn	56 (3) v (1) 57	12·0
31	3267	,,	Br	53−4, 57+4	11·7
31	3267	79	Ma	52−2	11·6
Aug					
5	3272	150	Bh	52−8	12·2
11	3278	117	Gi	52 (2) v (5·5) s	11·5*b*
12	3279	150	Bh	52−8	12·2
16	3283	75	Bg	52−2·5, =56, 57+5	11·6
17	3284	90	Bh	52−5	11·9
18	3285	120	Br	52−2, 57+5	11·6
20	3287	75	Bg	52−2, =56	11·6
24	3291	117	Gi	43 (2) v (1) 52	11·1
25	3292	120	Bn	52 (3) v (1) 57	11·9
25	3292	90	Bh	52−2	11·6
26	3293	75	Bg	52−1, 56+1	11·5
31	3298	,,	,,	=52	11·4
31	3298	90	Bh	52−2	11·6
Sept					
7	3305	,,	,,	=52	11·4
12	3310	94	Bl	43 (5) v (2) 52	11·1
15	3313	120	Br	52−2	11·6
15	3313	90	Bh	51−2, 52+2	11·2
18	3316	,,	,,	51−2, 52+2	11·2
18	3316	,,	Hw	52 (3) v (7) 58	11·7
19	3317	117	Gi	=51	11·0
20	3318	75	Bg	=52	11·4
20	3318	120	Bn	51−5, 52−2	11·5
21	3319	90	Bh	52+1	11·3
26	3324	,,	,,	51−1, 52+3	11·1
29	3327	142	Bg	=52	11·4*b*
30	3328	90	Bh	51+2, 52+6	10·8
Oct					
4	3332	,,	,,	21−10, =51	10·7
6	3334	,,	,,	21−7, =34	10·1
6	3334	94	Bl	30 (5) v (1) 43, =43	10·4
1922 Oct					
7	3335	90	Hw	=52	11·4*b*
11	3339	75	Bg	51−1, 52+2	11·1
12	3340	117	Gi	30 (2·5) v (3·5) 43	10·2
12	3340	90	Bh	21−4, =28	9·8
14	3342	,,	,,	21−2, 25−1	9·6
14	3342	160	Br	=51	11·0
14	3342	120	Bn	=43	10·5
14	3342	94	Bl	21 (5) v (2) 30	9·8
16	3344	90	Hw	=43	10·5*b*
18	3346	,,	Bh	=21	9·4
22	3350	50	Bn	21 (1) v (3) 26	9·5
25	3353	55	Bg	21−4, 30+1·5	9·8
25	3353	90	Bh	21+3	9·1
26	3354	22	Bl	=16, =18	9·0
28	3356	40	Hw	=16	8·9
28	3356	45	Bh	=14, 21+5	8·9
Nov					
1	3360	90	,,	21+10	8·4
1	3360	30	Bg	11−2, 12+2	8·3*b*
4	3363	45	Bh	6−8, =10, 14+8	8·0
5	3364	75	Gi	5 (4) v (3) 9	7·9
9	3368	30	Bg	8−1, 11+3	7·8*b*
9	3368	90	Bh	=8	7·7
11	3370	22	Bl	3 (3) v (1) 6, =6	7·1
11	3370	45	Br	=6	7·2
14	3373	90	Bh	6−5, 8+1	7·6
15	3374	30	Bn	4 (2) v (1) 6	7·1
15	3374	31	D	=5	7·5
18	3377	45	Bh	=6	7·2
19	3378	,,	,,	3−3, 6+2	7·0
22	3381	47	Gi	3 (2) v (3·5) 6	6·9
24	3383	30	Bg	=4, 6+2	7·0
24	3383	,,	Bn	3 (1) v (2) 4	6·8
24	3383	45	Bh	=1, 3+5	6·2
28	3387	,,	,,	3+5	6·2
Dec					
1	3390	,,	,,	3+3, 6+6	6·5
6	3395	,,	,,	=1	6·3
6	3395	F	Bg	=4, 6+2	7·0*b*
6	3395	30	Bn	1 (2) v (1) 3	6·6
7	3396	47	Gi	1 (2·5) v (1) 3	6·6*b*
11	3400	45	Bh	3+4, 6+8	6·3
14	3403	22	Bl	1 (3) v (1) 3	6·6
16	3405	30	Bg	4−1, 6+1	7·1*b*
17	3406	45	Bh	6+8	6·4
18	3407	,,	,,	3+4, 6+6	6·4
19	3408	,,	Br	4+4	6·6
19	3408	25	Bn	3 (1) v (1) 4	6·8*b*
22	3411	30	Bg	6−2, 8+3	7·4
25	3414	45	Bh	6+5	6·7
26	3415	40	Hw	=6	7·2
26	3415	22	Bl	1 (4) v (1) 3	6·6*b*
1923 Jan					
4	3424	30	Bg	6−4, 8+1	7·6*b*
4	3424	45	Br	4−1, 6+1	7·1
4	3424	90	Bh	=3, 6+4	6·7
7	3427	34	Li	2 (8) v (2) 3	6·7
8	3428	30	Bn	4 (2) v (1) 6	7·1

June 15, 21, Difficult.
July 2, 4, Not seen.
July 10, Br, Difficult.
July 20, Gi, 6c.
Aug. 11, 6c.
Aug. 25, Bn, t.
Sept. 19, 6c.

Oct. 12, Gi, 7c.
Oct. 14, Bl, With 22, 9·9.
Nov. 5, 22, 6c.
Dec. 6, Bg, 7c.
Dec. 7, 6c.
Dec. 19, Br, About.
Dec. 26, Bl, Uncertain.

(8600) R CASSIOPEIÆ—*continued.*

1923					
Jan					
11	3431	22	Bl	3 (2) v (2) 6, 3 (2·5) v (1·5) 6	7·0
11	3431	90	Bh	6+2	7·0
12	3432	50	Ma	6 (1) v (1) 12	7·8
14	3434	90	Bh	6+2	7·0
14	3434	34	Li	3 (5) v (5) 4	6·8
14	3434	30	Bn	6 (1) v (3) 7	7·2
15	3435	,,	Bg	6−3, 8+2	7·5
18	3438	,,	Bn	6 (1) v (2) 7	7·2
18	3438	50	Ma	6 (2) v (3) 12	7·7
20	3440	,,	,,	6 (1) v (1) 12	7·8
20	3440	34	Li	4 (1) v (5) 9	7·0
23	3443	22	Bl	=6	7·2*b*
25	3445	50	Bn	7 (1) v (6) 9	7·5
27	3447	90	Bh	=6	7·2
Feb					
4	3455	45	Br	8+4	7·3
4	3455	50	Bn	7 (1) v (3) 9	7·6
4	3455	90	Wh	=4	7·0
5	3456	40	Hw	=8	7·7
6	3457	31	D	5−5, 9+3	7·9
6	3457	22	Bl	6 (3) v (3) 8	7·4
8	3459	90	Bh	6−2	7·4
11	3462	50	Bn	7 (2) v (1) 9	7·9
14	3465	,,	Ma	12+4, 18+5	8·3
16	3467	90	Bh	6−4, 8+1	7·6
17	3468	22	Bl	6 (4) v (2) 8	7·5
18	3469	48	Bg	11−3, 12+1	8·4
23	3474	40	Hw	8 (6) v (4) 13	8·2*b*
25	3476	90	Bh	6−6, 8−1	7·8
26	3477	48	Bg	11−3, 12+1	8·4*b*
Mar					
5	3484	79	Ma	12+2	8·3
5	3484	90	Bh	8−6, 13+3, 15+5	8·3
10	3489	48	Bg	12−1, 16+3	8·6*b*
17	3496	90	Hw	=18	9·0
17	3496	,,	Bh	19+2, 21+3	9·0
21	3500	45	,,	21+2	9·2*b*
25	3504	90	,,	19+1, 21+4	9·0
26	3505	40	Hw	=18	9·0
Apr					
4	3514	22	Bl	15−2, =18	9·0
13	3523	90	Bh	21+2	9·2
14	3524	65	Bg	16−1, 21+4	9·0*b*
17	3527	90	Bh	21+1	9·3
20	3530	22	Bl	18 (1) v (4) 21	9·1
29	3539	90	Bh	=21	9·4
May					
1	3541	75	Gi	15 (1·5) v (2·5) 21	9·0
3	3543	34	Li	12 (6) v (4) 14	8·7*b*
5	3545	30	D	21−1, 30+4	9·5
7	3547	90	Bh	=21	9·4
12	3552	94	Bl	18 (3) v (1) 21	9·3
13	3553	30	D	21−3, 30+3	9·7
21	3561	90	Bh	21+1	9·3
23	3563	117	Gi	21 (1) v (2) 30	9·6
24	3564	22	Bl	=30	9·9
25	3565	30	D	21−3, 30+2	9·7
30	3570	90	Bh	21−2	9·6

Jan. 20, Ma, Red. Li, Bright orange. Difficult.
Feb. 14, Red.
Mar. 5, Ma, Faint touch of red.
May 1, 8c.
May 23, 6c.
May 24, Difficult.

1923					
June					
2	3573	90	Bh	21−4	9
2	3573	,,	Wh	=30	9
10	3581	30	D	=30	9
11	3582	90	Bh	21−5, 30−1	10
18	3589	94	Bl	21 (4) v (1) 30	9
23	3594	90	Wh	=43	10
26	3597	60	D	30−5, 43+1	10
July					
1	3602	90	Bh	21−12, 51+6	10
5	3606	94	Bl	30 (5) v (1) 43, =43	10
6	3607	75	Bg	43 (1) v (3) 51	10
7	3608	90	Wh	=52	11
8	3609	,,	Bh	=51	11
10	3611	94	Bl	30 (5) v (1) 43	10
12	3613	117	Gi	=43	10
13	3614	120	D	52−2	11
20	3621	90	Bh	52+1	11
25	3626	193	Li	=52	11
25	3626	108	Ma	52−3	11
30	3631	90	Bh	52−2	11
Aug					
1	3633	,,	,,	52−4	11
3	3635	,,	,,	52−5	11
3	3635	75	Bg	52 (1) v (3) 57, =45	11
3	3635	90	Wh	=57	12
7	3639	OG	Ph	=57	12
7	3639	108	Ma	52−5	11
8	3640	120	Bn	56 (3) v (1) 57	12
9	3641	160	Br	57+3	11
9	3641	90	Bh	52−6, 57+3	11
11	3643	75	Bg	52 (2) v (3) 57, =56	11
12	3644	108	Ma	52−4, 58+4	11
15	3647	120	Bn	56 (1) v (2) 57	11
15	3647	90	Bh	52−7, 57+1	12
18	3650	108	Ma	52−5	11
22	3654	110	Bg	=57	12
26	3658	150	Bh	52 (1) v (1) 58	11
28	3660	108	Ma	52−6	12
30	3662	,,	,,	52−7·5, 58+3·5	11
30	3662	90	Bh	52 (3) v (2) 58	11
Sept					
1	3664	108	Ma	52 (9) v (1) 58, 51−5, 52−10, 58+5	11
3	3666	90	Bh	52 (2) v (1) 58	11
5	3668	150	,,	52 (4) v (1) 58	11
6	3669	,,	Bn	58 (1) v (2) w	11
7	3670	120	Br	=58	11
7	3670	90	Bh	=57, 58+3	11
8	3671	180	Bg	57 (1) v (2) 58	11
8	3671	OG	Ph	52 (3) v (1) 58	11
13	3676	90	Bh	52 (1) v (1) 58	11
15	3678	,,	,,	52−2, 57+5	11
15	3678	94	Bl	52 (3) v (3) 57	11
15	3678	75	Pr	=52	11
15	3678	50	Ma	52−2·5	11
15	3678	150	Bn	58 (1) v (2) w	11
17	3680	180	Bg	57 (3) v (1) 58	11
17	3680	90	Hw	=58	11
17	3680	OG	Ph	57−2, =58	11
18	3681	79	Ma	52−3	11
23	3686	,,	,,	52−3·5	11
26	3689	150	Bh	52−2	11
29	3692	90	Wh	52 (1) v (1) 58	11

July 12, 7c.
Aug. 7, Ma, Difficult.
Aug. 22, About.

(8600) R CASSIOPEIÆ—*continued.*

1923 Sept					
30	3693	180	Bg	=58	12·4*b*
30	3693	90	Bh	=52	11·4
Oct.					
1	3694	120	Br	58+2	12·2
4	3697	200	Bn	57+1	12·0
4	3697	90	Hw	52 (7) v (3) 58	12·1
4	3697	,,	Bh	52+1	11·3
11	3704	,,	,,	51−1, 52+2	11·1
11	3704	120	Br	52−1	11·5
13	3706	94	Bl	30 (5) v (2) 43	10·3
13	3706	75	Pr	30−3, 40+2	10·3*b*
14	3707	120	Bn	52 (3) v (2) 57	11·8
15	3708	75	Bg	52 (1) v (2) 56	11·4
15	3708	90	Hw	52 (5) v (5) 58	11·9*b*
17	3710	,,	Bh	=51, 52+3	11·0
22	3715	,,	,,	51+2, 52+6	10·8
22	3715	110	Bg	51 (2) v (1) 52	11·3
26	3719	90	Bh	51+3	10·7
26	3719	,,	Hw	=52	11·4*b*
28	3721	120	Bn	51 (4) v (1) 52	11·3
29	3722	,,	D	52+2	11·2*b*
29	3722	94	Bl	30 (4) v (4) 43	10·2
30	3723	90	Wh	43 (1) v (1) 52	10·9
Nov					
3	3727	,,	Bh	51+6, 52+9	10·4
4	3728	75	Bg	43 (1) v (1) 51	10·7
4	3728	,,	Pr	=36, 43+2	10·3*b*
5	3729	160	Br	=30	9·9
6	3730	120	Bn	30 (3) v (2) 43	10·3
7	3731	90	Bh	30−2, 36+2	10·1
7	3731	22	Bl	=30	9·9
10	3734	75	Bg	43 (1) v (3) 51	10·6
11	3735	,,	Pr	18−2, 21+2	9·2
11	3735	90	Bh	=30	9·9*b*
16	3740	22	Bl	21 (3) v (3) 30	9·7
23	3747	90	Bh	14 (2) v (1) 21	9·2
29	3753	22	Bl	15 (4) v (3) 21	9·1
30	3754	55	Bg	=30	9·9*b*
30	3754	50	Bn	16 (1) v (1) 18	9·0
30	3754	45	Bh	13−10, 21−3	9·7
Dec					
2	3756	90	,,	21−2	9·6
3	3757	50	Bn	18+1, 21+3	9·0
4	3758	90	Hw	21 (5) v (5) 30	9·7
4	3758	,,	Bh	21+3	9·1
8	3762	,,	,,	13−2, 21+6	8·8
9	3763	30	D	15−5, 21+1	9·3
9	3763	75	Pr	=12, 14+3, 16+3	8·5
9	3763	45	Br	16−2, 21+2	9·2
9	3763	55	Bg	21 (1) v (2) 30	9·6
12	3766	45	Bh	8 (1) v (2) 21	8·3
15	3769	50	Bn	9 (3) v (1) 12	8·4
16	3770	55	Bg	16 (3) v (1) 21	9·3
18	3772	45	Bh	6−4, 8+1	7·6
19	3773	50	Ma	16+3, 18+3, 25+3	8·8*b*
20	3774	22	Bl	11 (1) v (5) 15, =11	8·2
23	3777	75	Pr	=5, 8+2	7·5
23	3777	50	Bn	9 (1) v (2) 12	8·3
24	3778	40	Hw	8 (5) v (5) 13	8·2*b*
24	3778	45	Bh	6−3, 8+2	7·5
28	3782	,,	,,	6−2	7·4
28	3782	50	Ma	16+7, 18+2	8·5*b*

Oct. 13, Pr, Difficult. Deep red.
Oct. 29, D, Difficult.
Nov. 5, Very orange.
Dec. 28, Ma, Coppery red.

1923 Dec					
28	3782	45	Br	8−4, 13+4	8·2
30	3784	30	D	9−4, 15+3	8·5
31	3785	90	Bh	6−1	7·3
1924 Jan					
2	3787	50	Bn	7 (2) v (1) 9	7·9
3	3788	45	Bh	6−2	7·4
3	3788	30	Bg	8 (3) v (1) 11	8·0
5	3790	,,	,,	8 (1) v (1) 11	7·9*b*
5	3790	40	Hw	=8	7·7
5	3790	,,	D	5 (3) v (2) 9, 9+5	7·8
6	3791	30	,,	5−2, 9+4	7·7
6	3791	50	Bn	6 (1) v (2) 8	7·3
6	3791	45	Br	6−2, 8+4	7·3
6	3791	22	Bl	6 (4) v (2) 8	7·5
6	3791	45	Bh	6+1	7·1
11	3796	,,	,,	3−1, 6+3	6·8
11	3796	40	D	=5	7·5
15	3800	,,	,,	3−4, 6+1	7·6
15	3800	30	Bg	6 (2) v (3) 8	7·4
15	3800	22	Bl	3 (2) v (2) 4	6·8
16	3801	45	Bh	6+5	6·7
20	3805	,,	,,	6+5	6·7
20	3805	25	Bn	3 (2) v (1) 4	6·9
23	3808	40	D	3+2	6·5
23	3808	22	Bl	1 (2) v (3) 3	6·4
23	3808	45	Bh	3+2	6·5
25	3810	25	Bn	1 (3) v (2) 3	6·5
25	3810	40	Hw	=6	7·2*b*
25	3810	45	Br	=4	7·0
26	3811	,,	Bh	3+3	6·4
27	3812	30	D	1−3, 3+2	6·5
29	3814	F	Bg	2 (1) v (2) 4	6·8
29	3814	25	Bn	1 (1) v (2) 3	6·4
31	3816	40	D	1−2, 3+3	6·4
31	3816	45	Bh	3+1	6·6
Feb					
1	3817	30	Bn	1 (2) v (1) 3	6·6
1	3817	F	Bg	2 (1) v (2) 4	6·8
1	3817	40	Hw	=4	7·0
1	3817	22	Bl	1 (1) v (4) 3, =1	6·3*b*
4	3820	25	Bn	3+1	6·6
8	3824	B	Bg	4 (1) v (1) 6	7·1*b*
11	3827	45	Bh	3+2	6·5
13	3829	40	D	1−2, 3+3	6·4
14	3830	22	Bl	=1	6·3
14	3830	45	Bh	3+2, 6+5	6·6
16	3832	50	Bn	3 (1) v (3) 4	6·8
20	3836	22	Bl	1 (2) v (4) 3	6·3
21	3837	45	Bh	3+3	6·4
23	3839	40	D	1−3, 3+2	6·5
24	3840	45	Br	4+2	6·8
24	3840	50	Bn	4−1	7·1
25	3841	90	Wh	=4	7·0
26	3842	25	Bn	4 (1) v (1) 6	7·1
26	3842	45	Bh	3+2	6·5
28	3844	22	Bl	1 (1) v (5) 3	6·3
28	3844	40	Hw	=4	7·0*b*

Jan. 6, D, 7ᶜ.
Jan. 15, D, 6ᶜ·5.
Jan. 23, D, 7ᶜ.
Jan. 25, Br, Rather orange.
Jan. 27, 6ᶜ.
Jan. 29, Bg, With 55, 8ᶜ.
Feb. 13, 6ᶜ.
Feb. 23, 7ᶜ.
Feb. 24, Br, Orange-red.

(8600) R CASSIOPEIÆ—*continued.*

1924					
Mar					
1	3846	45	Bh	=3, 6+5	6·7
2	3847	30	D	1−3, 3+1	6·6
4	3849	40	,,	1−2, 3+1	6·5
4	3849	25	Bn	4 (1) v (3) 6	7·0
7	3852	26	Bg	2 (1) v (1) 4	6·9
7	3852	45	Bh	=3	6·7
8	3853	40	D	1−4, 3+1	6·6
8	3853	25	Bn	4 (2) v (3) 6	7·1
9	3854	22	Bl	1+0·5	6·2
9	3854	50	Ma	6+3	6·9
9	3854	45	Bh	1−3, 3+1	6·6
10	3855	90	Wh	4+1	6·9*b*
11	3856	40	D	1−3, 3+2	6·5
14	3859	,,	,,	1−2, 3+1	6·5
15	3860	45	Bh	=1, 3+3	6·3
16	3861	26	Bg	=4, 6+3	6·9*b*
19	3864	25	Bn	4 (1) v (3) 6	7·0
19	3864	45	Bh	4 (1) v (1) 3	6·5*b*
20	3865	22	Bl	1 (1) v (5) 3, =1	6·3*b*
22	3867	45	Bh	=3, 6+3	6·8*b*
23	3868	31	D	1−2, 3+1	6·5
24	3869	40	Hw	=6	7·2*b*
29	3874	90	Bh	3+2	6·5
29	3874	25	Bn	4 (1) v (2) 6	7·0
30	3875	31	D	1−4, =3	6·7
30	3875	22	Bl	1+0·5	6·2*b*
Apr					
1	3877	48	Bg	=6	7·2
3	3879	45	Bh	3+3, 6+6	6·5
4	3880	25	Bn	4 (1) v (2) 6	7·0
5	3881	40	D	=3	6·7
5	3881	,,	Hw	=4	7·0
7	3883	22	Bl	=6	7·2
8	3884	90	Bh	=3	6·7
20	3896	50	Bn	6 (2) v)1) 7	7·3
27	3903	90	Wh	4 (1) v (1) 16	7·9
30	3906	,,	Bh	6−8, =10	8·0
May					
4	3910	60	D	5−4, 9+3	7·9
7	3913	,,	,,	5−5, 9+3	7·9
9	3915	22	Bl	6 (4) v (1) 8	7·6
13	3919	,,	,,	6 (4·5) v (1·5) 8	7·6
13	3919	60	D	5−5, 9+2	8·0
16	3922	90	Bh	=10	8·0
19	3925	50	Bn	9 (3) v (2) 12	8·4
21	3927	90	Bh	10−1	8·1
26	3932	22	Bl	8 (1) v (2) 10	7·8
27	3933	30	D	9−3, 15+3	8·5
27	3933	48	Bg	=12	8·5*b*
27	3933	90	Bh	10−3	8·3
June					
4	3941	45	,,	6 (2) v (1) 18	8·4
5	3942	22	Bl	8 (2) v (1) 10	7·9
13	3950	90	Bh	8 (2) v (1) 18	8·6
16	3953	22	Bl	10 (3) v (4) 15	8·3
21	3958	34	Sa	15−1, 21+5	8·9
26	3963	60	D	15−5, 21+1	9·3
26	3963	75	Bg	16 (2) v (1) 21	9·2*b*
27	3964	90	Sa	5−10, 9−2, 21+7	8·5
29	3966	22	Bl	10 (6) v (2) 15	8·6

Mar. 2, 5°.
Mar. 4, D, 6°.
Mar. 7, Bg, 8°.
Mar. 8, D, 6°·5.
Mar. 9, Ma, Red.
Mar. 11, 14, 7°.

1924					
June					
30	3967	90	Bh	=14, =16, =17	8·
July					
1	3968	60	D	=21	9·
4	3971	45	Bh	=17	8·
6	3973	60	D	=21	9·
6	3973	75	Bg	=21	9·
7	3974	94	Bl	18+1	8·
9	3976	60	D	21−2, 30+4	9·
9	3976	90	Bh	21+2	9·
11	3978	50	Ma	21+2	9·
11	3978	,,	Bn	14−1, =16	8·
14	3981	90	Bh	21+2	9·
19	3986	,,	,,	21+1	9·
19	3986	79	Ma	=21	9·
24	3991	50	Bn	21 (2) v (1) 26	9·
24	3991	90	Bh	=21	9·
26	3993	94	Bl	18 (3) v (1) 21	9·
29	3996	90	Bh	=21	9·
29	3996	79	Ma	21−1, =30, 52+5	10
29	3996	56	Bn	26 (3) v (1) 30	9·
31	3998	60	D	=30	9·
Aug					
2	4000	90	Bh	21−1	9·
2	4000	,,	Wh	=30	9·
3	4001	80	Ry	=30, 43+2·5	10
5	4003	120	Bn	30 (2) v (1) 43	10
7	4005	75	Bg	=30	9·
7	4005	90	Bh	21−3, 23−2	9·
9	4007	94	Bl	18 (3) v (1) 21	9·
13	4011	120	D	30−4, 43+3	10
15	4013	134	Sa	30−10, 52+5	10
15	4013	90	Bh	21 (2) v (3) 51	10
18	4016	79	Ma	52+1	11
19	4017	90	Bh	21 (2) v (1) 51	10
19	4017	120	Br	43−6, 52+3	11
19	4017	,,	Bn	43 (1) v (4) 51	10
19	4017	75	Bg	=43	10
25	4023	90	Bh	=43, =42	10
27	4025	120	D	52+1	11
27	4025	134	Sa	=52	11
27	4025	75	Bg	=51	11
31	4029	90	Bh	51+1	10
Sept					
1	4030	64	Sa	=52	11
3	4032	90	Bh	51−1, 52+3	11
6	4035	94	Bl	30 (5) v (1) 43	10
7	4036	79	Ma	=52	11
8	4037	150	Bh	=52	11
8	4037	90	Hw	52 (2) v (8) 58	11
8	4037	,,	Sa	52−2, 57+6	11
9	4038	120	Bn	52−1	11
12	4041	150	Bh	=52	11
16	4045	,,	,,	52−1	11
17	4046	94	Bl	=43	10
17	4046	134	Sa	53−5, 57+2	11
22	4051	110	Bg	54 (1) v (4) 57	11
22	4051	90	Hw	43 (7) v (3) 52	11
22	4051	120	D	52 (3) v (2) 58, 58+3	12
23	4052	150	Bh	52−2	11

July 6, D, 7°.
July 7, With 22, 9·2.
July 11, Ma, Slightly red.
July 19, Ma, Pale yellow.
July 26, With 22, 9·7.
July 29, Ma, Reddish.
Aug. 9, With 22, 10·1.

(8600) R CASSIOPEIÆ—*continued.*

1924 Sept					
24	4053	134	Sa	=57	12·1
26	4055	150	Bh	52−4	11·8
27	4056	120	Br	52−5, 57+2·5	11·9
29	4058	94	Bl	30 (6) v (1) 43	10·4
Oct					
1	4060	90	Bh	52−5	11·9
1	4060	,,	Wh	52 (1) v (1) 58	11·9
1	4060	,,	Sa	56−1, 57+2	11·8
3	4062	OG	Ph	57+1	12·0
6	4065	134	Sa	52−5, 58+5	11·9
11	4070	150	Bh	52 (2) v (1) 58	12·1
11	4070	94	Bl	52+1·5	11·2*b*
13	4072	90	Hw	52 (5) v (5) 58	11·9*b*
17	4076	150	Bh	52 (2) v (1) 58	12·1
20	4079	,,	,,	52 (3) v (2) 58	12·0
23	4082	90	,,	52 (2) v (1) 58	12·1
23	4082	134	Sa	=58	12·4
23	4082	90	Hw	=58	12·4
23	4082	150	Bn	52 (7) v (1) 57	12·0
23	4082	120	Br	57−1, 58+2	12·2
24	4083	M	Ph	=57, 58+3	12·1
27	4086	90	Wh	52 (2) v (1) 58	12·1
27	4086	150	Bh	52 (3) v (2) 58	12·0
30	4089	200	Ry	=57, =58	12·3
31	4090	150	Bh	52 (2) v (1) 58	12·1
Nov					
2	4092	90	,,	52 (3) v (2) 58	12·0
3	4093	94	Bl	=52	11·4
3	4093	134	Sa	=58	12·4
3	4093	142	Bg	57 (1) v (2) 58	12·2
3	4093	94	Li	52 (5) v (5) 56	11·5*b*
4	4094	193	,,	52 (5) v (5) 57	11·7
4	4094	90	Bh	52 (1) v (1) 58	11·9
15	4105	,,	,,	52 (1) v (2) 58	11·7
15	4105	94	Bl	=56	11·6
22	4112	200	Ry	52−6, 57+3, 58+3	12·0
27	4117	150	Bn	52 (3) v (1) 57	11·9
27	4117	94	Bl	52 (4) v (2) 57	11·9
27	4117	90	Bh	51−6, 52−3	11·6
28	4118	134	Sa	53−6, 58+3	12·0
30	4120	90	Wh	51 (1) v (1) 52	11·2
Dec					
2	4122	,,	Bh	52−2	11·6
6	4126	,,	,,	52−2	11·6
6	4126	94	Li	52 (5) v (5) 56	11·5
13	4133	134	Sa	=51, =53	11·1
14	4134	90	Bh	52 1	11·5
14	4134	,,	Wh	=52	11·4
14	4134	120	Bn	52 (2) v (1) 57	11·9
14	4134	75	Bg	52 (1) v (1) 56	11·5*b*
17	4137	40	Hw	52 (3) v (7) 58	11·7
19	4139	134	Sa	=52	11·4
19	4139	90	Bh	=52	11·4
22	4142	142	Bg	52	11·4*b*
24	4144	80	D	52+1	11·3*b*
24	4144	90	Wh	=51	11·0
26	4146	,,	Bh	51+3, 52+6	10·7
27	4147	200	Ry	30−6, 43+2, 52+3	10·6*b*
28	4148	142	Bg	=51	11·0
29	4149	80	D	=52	11·4
30	4150	150	Bn	43 (2) v (1) 51	10·8
31	4151	90	Bh	43 40+3, 51+5	10·5*b*
31	4151	M	Ph	51+5, 52+5	10·7*b*

Nov. 3, 4, Li, Difficult.

Dec. 22, About.
Dec. 24, D, Difficult.

(432) S CASSIOPEIÆ. (V. 2.)

H.D. 011272.

Stars β and ϵ estimated by Waterfield as follows:—

β $\Delta\alpha$ + 14^s, $\Delta\delta$ − 0′·7 14^m·6.
ϵ ,, − 2, ,, − 1·0 15·0.

Date.	Julian Date.	Inst.	Observer.	Comparisons.	Deduced Mag.
1921 May					
13	2823	...	Wf	<60	<13·6
June					
2	2843	231	,,	51−1, 60+3	13·3
26	2867	62	,,	0−3, 27+2	11·3
July					
9	2880	62	Wf	0−2, 27+3	11·2
14	2885	,,	,,	19−2, 0+3	10·9
24	2895	,,	,,	=19	10·8
31	2902	,,	,,	=0	11·1*b*
Aug					
8	2910	,,	,,	15−3, 19+1	10·7
25	2927	,,	,,	=19	10·8

May 13, Estimated 14·0 mag.
June 2, 67 seen fairly easily.
June 26, July 14, Aug. 25, 6-in.

July 9, 24, 31, Aug 8, 3-in.

(432) S CASSIOPEIÆ—*continued.*

1921					
Sept					
23	2956	62	Wf	=o	11·1
Oct					
4	2967	,,	,,	15−3, 19+1	10·7
22	2985	,,	,,	14−3, 15+2	10·3
Dec					
15	3039	,,	,,	e (1) v (1) 5, =f	8·4*b*
30	3054	,,	,,	f−1, 5+3	8·5*b*
1922					
Jan					
2	3057	...	Sa	e−12, f−8, 5−2, 14+10, 12+12	9·1
10	3065	62	Wf	1 (4) v (1) 5	8·5*b*
17	3072	,,	,,	5+2	8·6
22	3077	...	Sa	5−8, 11+2, 12+10	9·5
23	3078	62	Wf	5 (1) v (1) 11	9·3
Feb					
1	3087	...	Sa	f−12, 5−4, 14+4, 12+12	9·4
4	3090	62	Wf	5−7, 11+3	9·5
18	3104	...	Sa	14+3	9·8*b*
19	3105	62	Wf	5 (3) v (2) 11	9·4
28	3114	,,	,,	5 (3) v (2) 11, 11+5	9·3
Mar					
4	3118	...	Sa	5−10, h−5, =11, =14	9·8
10	3124	62	Wf	v (3) 11 (2) 14	9·4*b*
22	3136	,,	,,	11+4	9·4
31	3145	...	Sa	11−5, 14−6, 12−2, =19, 0+3	10·6
Apr					
5	3150	150	Wf	=14	10·1
17	3162	...	Sa	11−8, 14−8, 12−6	10·8
19	3164	62	Wf	12 (1) v (1) 19	10·6
29	3174	,,	,,	12−3, 19+1	10·7
May					
5	3180	...	Sa	11−10, 12−7	11·9*b*
14	3189	150	Wf	0 (1) v (1) 27	11·3
22	3197	,,	,,	0−3, 27+1	11·4
29	3204	62	,,	=27	11·5
June					
24	3230	150	,,	32 (1) v (1) 41	12·2
25	3231	...	Sa	27−2, 35+1	11·9
July					
21	3257	...	,,	35−5	12·8
23	3259	157	Wf	42−3, 52+2	12·8
Aug					
16	3283	,,	,,	=51	13·2
23	3290	,,	,,	51 (1) v (1) w	13·4
Sept					
2	3300	...	Sa	35−3	12·6
10	3308	157	Wf	51−1, w+1	13·4
16	3314	,,	,,	=x	13·9
23	3321	,,	,,	=w	13·6*b*
Oct					
11	3339	231	,,	=y	14·3
13	3341	,,	,,	=y	14·3
Nov					
17	3376	,,	,,	y−5	14·8

Sept. 23, Oct. 22, 6-in. Oct. 4, 3-in.
Oct. 11, Difficult.
Nov. 17, Glimpsed several times.

1922					
Dec					
14	3403	...	Sa	35−5, 51+5	12
1923					
Jan					
9	3429	94	Ni	Estimated	<14
16	3436	,,	,,	,,	<14
20	3440	157	Wf	<y	<14
27	3447	90	Bh	<53	<13
Feb					
6	3457	94	Ni	Estimated	<14
7	3458	157	Wf	=y	14
17	3468	94	Ni	< (w−2)	<13
23	3474	90	Bh	53+1	12
Mar					
2	3481	,,	,,	53+3	12
13	3492	,,	,,	35+1, 42+3	12
16	3495	94	Ni	=35	12
17	3496	90	Bh	35+1	12
21	3500	,,	,,	32−1, 47+6	12
21	3500	94	Ni	27 (5) v (2) 35	12
27	3506	,,	,,	=27	12
27	3506	90	Bh	27−4, 42+6	12
Apr					
6	3516	94	Ni	27+1	12
6	3516	150	Wf	12−5, =19	12
8	3518	90	Bh	11−10, 27+5	12
8	3518	94	Li	19 (5) v (5) 20	12
10	3520	,,	Ni	17 (2) v (3) 27	12
10	3520	150	Wf	=21, 27+2	12
13	3523	90	Bh	14−6, 12−3	12
14	3524	...	Sa	11−5, 14−4, =17, 27+8	12
15	3525	62	Wf	14−2, 19+4	12
17	3527	90	Bh	14−8, 27+5	12
19	3529	94	Li	14 (4) v (6) 19	12
20	3530	,,	Ni	=17	12
23	3533	...	Sa	=17	12
29	3539	90	Bh	14−5, 12−2	12
May					
1	3541	...	Sa	11−4, =12, 14−5	12
5	3545	94	Ni	11 (4) v (4) 17	12
6	3546	62	Wf	11−4, =14	12
7	3547	90	Bh	12−1, 17+2	12
12	3552	...	Sa	11−4, 14−4, 12+2, 17+4	12
16	3556	44	Li	=11	
17	3557	90	Bh	11−5	12
20	3560	62	Wf	11−4, 14−1, 17+3	12
24	3564	94	Ni	11 (5) v (1) 17	12
30	3570	90	Bh	11−3, 12+3	12
June					
2	3573	,,	,,	11−4, 14−1, 12+2	12
6	3577	62	Wf	14−1, 19+5	12
11	3582	94	Li	11 (2) v (8) 12	
11	3582	...	Sa	=11, 14+1	
11	3582	90	Bh	=14	12
22	3593	OG	Ph	4−7, 11+4	
22	3593	37	Lp	5 (2) v (1) 6, 5 (2) v (2) 9	
23	3594	90	Bh	=4	

Jan. 9, 16, 27, Not seen.
Jan. 20, Invisible.
Feb. 6, 17, Seen.

(432) S CASSIOPEIÆ—*continued.*

1923					
July					
1	3602	90	Bh	4+3	8·2
2	3603	37	Lp	4 (2) v (1) 5	8·7*b*
4	3605	22	Ni	B (1·5) v (1·5) h	8·9
5	3606	90	Bh	4+3	8·2
6	3607	...	Sa	4+1	8·4
8	3609	62	Wf	1 (6) v (4) 4	8·0
8	3609	37	Lp	4 (2) v (2) 5	8·6
12	3613	22	Ni	B (1) v (3) h	8·7
13	3614	37	Lp	=4	8·5*b*
18	3619	,,	,,	3 (9) v (1) 4	8·3*b*
18	3619	...	Sa	3−8, 1−7, 4+6	7·9
18	3619	62	Wf	1−6, 4+5	7·9
20	3621	34	Li	=3	7·0
20	3621	OG	Ph	=1	7·3
20	3621	45	Bh	4+4	8·1
22	3623	37	Lp	3 (2) v (1) 4	8·0*b*
25	3626	34	Li	3 (5) v (5) 1	7·1
25	3626	...	Sa	3−2, 1−3, 4+8, 5+10	7·6
26	3627	37	Lp	3 (2) v (2) 4	7·7*b*
27	3628	22	Ni	A (4) v (2) B	8·0
30	3631	45	Bh	3−4, =1	7·3
Aug					
1	3633	...	Sa	3−6, 1−5, 4+6, 5+8	7·8
1	3633	45	Bh	3−5, =1	7·4
3	3635	,,	,,	1−1	7·4
4	3636	22	Ni	A (4) v (2) B	8·0
5	3637	62	Wf	3−5, 1−4, 4+6	7·7
6	3638	OG	Ph	1 (1) v (1) 4, 1−4, 4+6	7·8
9	3641	45	Bh	3−6, 1−1	7·5
11	3643	...	Sa	1−4, 4+8	7·7
11	3643	37	Lp	3 (2) v (1) 4	8·0
12	3644	62	Wf	1−3, 3+5	7·5
12	3644	45	Bh	=1	7·3*b*
15	3647	,,	,,	1−10, 4+3	8·2
15	3647	37	Lp	3 (2) v (1) 4	8·0
15	3647	...	Sa	3−7, 1−4, 4+7, 8+10	7·8
22	3654	...	,,	2−15, 3−8, 4+6, 5+6	7·9
22	3654	45	Bh	1−10, 4+2	8·3
26	3658	37	Lp	3 (4) v (1) 4	8·2*b*
28	3660	...	Sa	2−20, 3−10, 4+4, 5+7	8·1
30	3662	...	,,	3−10, 1−12, 4+2, 5+6	8·2
30	3662	37	Lp	3 (9) v (1) 4	8·3*b*
30	3662	45	Bh	1−10, 4+2	8·3
Sept					
2	3665	,,	,,	1−10, 4+3	8·2
2	3665	22	Ni	4+1	8·4
3	3666	62	Wf	1−7, 4+3	8·1
4	3667	37	Lp	4 (2) v (2) 5	8·6*b*
7	3670	90	Bh	4+3	8·2
7	3670	37	Lp	=5	8·8
8	3671	50	Bn	4+1	8·4
8	3671	62	Wf	1−7, 4+1	8·2

July 20, Li, 5c.
July 22, Very ruddy.
July 26, Fiery red.
Aug. 11, Very ruddy.
Aug. 15, Lp, 8c.

1923					
Sept					
9	3672	22	Ni	4 (3) v (6) 8	8·7
11	3674	37	Lp	5 (1) v (2) 6	8·8*b*
11	3674	50	Bn	e (2) v (1) 4	8·3
13	3676	90	Bh	4+1	8·4
14	3677	62	Wf	4−2	8·7*b*
15	3678	37	Lp	=5	8·8
15	3678	...	Sa	3−15, 4−1, =5, 8+6	8·6
15	3678	90	Bh	4+2	8·3
18	3681	37	Lp	=5	8·8*b*
21	3684	,,	,,	=5	8·8*b*
22	3685	90	Bh	4+1	8·4
26	3689	,,	,,	=4	8·5
29	3692	62	Wf	4−5, 9+6	9·0
29	3692	...	Sa	5−1, 6+1	8·8
30	3693	37	Lp	5 (1) v (2) 8	8·9*b*
30	3693	45	Bh	=4	8·5*b*
Oct.					
3	3696	...	Sa	4−5, =6, 9+8	8·9
4	3697	50	Bn	4 (2) v (1) 5	8·7
4	3697	90	Bh	4−2, 5+1	8·7
7	3700	,,	,,	4 (1) v (2) 11	8·9
9	3702	62	Wf	4−6, 9+5	9·1
11	3704	...	Sa	4−4, 9+6	8·9
12	3705	22	Ni	8 (2) v (3) 11	9·4
12	3705	45	Bh	4−5	9·0
13	3706	37	Lp	5 (2) v (1) 9	9·3*b*
14	3707	...	Sa	5−4, 8+2, 9+4	9·1
19	3712	90	Bh	4 (1) v (2) 11	8·9
22	3715	,,	,,	4−5, 9+3, 11+3	9·2
22	3715	100	Lp	=9	9·6*b*
24	3717	50	Bn	5−2·5, 8+1	9·0
25	3718	45	Bh	11+2, 14+5	9·6*b*
27	3720	,,	,,	11+1	9·7*b*
30	3723	62	Wf	11+3, 14+5	9·5
Nov					
3	3727	100	Lp	9 (2) v (2) 11, =10	9·7
3	3727	90	Bh	=11, 14+3	9·8
6	3730	,,	,,	=11, =14	9·9*b*
6	3730	...	Sa	10−3, =11, 14+1	9·9
8	3732	94	Ni	11+2·5	9·5
10	3734	90	Bh	11−2, 14+2	9·9
14	3738	120	Bn	11 (1) v (2) 14	9·9
17	3741	90	Bh	11−3, 14+1	10·0
17	3741	100	Lp	=11	9·8*b*
24	3748	...	Sa	11−3, 12−2, 17+3	10·3
30	3754	90	Bh	=14	10·1*b*
Dec					
2	3756	,,	,,	11−4, =14	10·1
3	3757	...	Sa	11−3, 12+2	10·1
3	3757	120	Bn	12 (2) v (1) 17	10·5
5	3759	90	Bh	11−3, 12+3	10·1
9	3763	100	Lp	14−1	10·2*b*
9	3763	94	Ni	17 (3) v (4) 27	11·0
18	3772	90	Bh	12−4, =17, 20+2	10·8
18	3772	...	Sa	10+1, 12−5, 21+5	10·5
23	3777	100	Lp	14−5	10·6*b*
24	3778	...	Sa	12−5, 21+5	10·8*b*
24	3778	90	Bh	20−2, 27+3	11·2
28	3782	,,	,,	27+1	11·4
28	3782	...	Sa	27−2, 32+3	11·6

Oct. 13, Difficult.
Nov. 8, With 22, 9·8.

(432) S CASSIOPEIÆ—*continued.*

1924					
Jan					
2	3787	100	Lp	=23	11·5*b*
3	3788	90	Bh	27−1	11·6
3	3788	134	Sa	31−2, 42+2	12·2
6	3791	94	Ni	17 (7) v (1·5) 27	11·3
6	3791	150	Lp	=21	11·3*b*
11	3796	90	Bh	27−2	11·7
16	3801	,,	,,	27−4	11·9
16	3801	,,	Sa	=28	11·9
16	3801	94	Ni	27 (5) v (1) 35	12·1
17	3802	150	Wf	27−1, 30+3	11·6
19	3804	,,	,,	27 (2) v (3) 35	11·8*b*
20	3805	,,	Bh	27−7, 32−2	12·1
25	3810	90	,,	47−1, 52+2	12·8
27	3812	100	Lp	=30	12·0*b*
27	3812	94	Ni	27 (5) v (1) 35	12·1
29	3814	120	Bn	35 (1) v (2) 41	12·4
31	3816	90	Bh	=47, 52+3	12·7
Feb					
1	3817	150	Wf	35−1, 47+3	12·4
2	3818	120	Bn	35 (2) v (1) 47	12·5
4	3820	90	Bh	52+3	12·7
4	3820	150	Lp	35 (2) v (2) 47	12·5*b*
8	3824	157	Wf	35−2, 47+2	12·5
11	3827	90	Bh	52+2	12·8
14	3830	94	Ni	35 (3) v (1·5) 47	12·5
16	3832	134	Sa	<35	<12·3*b*
22	3838	90	Bh	52−3, =51	13·3*b*
23	3839	94	Ni	=52	13·0
25	3841	150	Bh	53−1	13·1*b*
29	3845	94	Ni	47 (3) v (1) 52	12·9
Mar					
1	3846	150	Bh	53−1	13·1
4	3849	,,	Bn	47 (2) v (1) 53	12·9
8	3853	,,	,,	47 (4) v (1) 53	12·9
8	3853	94	Ni	52−2, =53	13·1
9	3854	120	Bh	=51	13·2
10	3855	OG	Ph	53−1, =51	13·1
14	3859	150	Bh	53−3	13·3
22	3867	90	,,	53−3	13·3
29	3874	94	Ni	52 (3·5) v (1·5) w, 53 (3·5) v (1·5) w	13·4
Apr					
1	3877	200	Bn	53−3	13·3
3	3879	150	Bh	53−5	13·5
7	3883	157	Wf	w−2, x+1	13·8
7	3883	200	Bn	=51	13·2
16	3892	150	Bh	<w	<13·6
23	3899	231	Wf	w−2, x+1	13·8
29	3905	157	,,	y−1	14·4
May					
5	3911	231	,,	=y	14·3
5	3911	94	Ni	w−4	14·0
11	3917	231	Wf	=y	14·3
20	3926	157	,,	y−2·5	14·6
24	3930	94	Ni	<(w−4)	<14·0
25	3931	231	Wf	y−3, β−1	14·7
June					
1	3938	,,	,,	y−4, β−1	14·7
7	3944	,,	,,	y−4, =β	14·7
8	3945	94	Ni	<(w−2)	<13·8
20	3957	M	Ph	<y	<14·3*c*

Jan. 27, Lp, Difficult.
Feb. 4, Lp, Difficult.
Feb. 16, Not visible.
June 1, 30, Difficult, but certain.
June 20, Invisible.

1924					
June					
22	3959	231	Wf	y−5, β−1	14
24	3961	,,	,,	y−5, β−2	14
28	3965	,,	,,	β−3·5	15
30	3967	,,	,,	y−6, β−3	14
July					
3	3970	,,	,,	β−3	14
6	3973	94	Ni	w−5	14
7	3974	231	Wf	β−3·5	15
10	3977	,,	,,	β−3	14
20	3987	,,	,,	β−5	15
22	3989	,,	,,	β−5	15
24	3991	,,	,,	β−5, =ε	15
26	3993	94	Ni	<(w−4)	<14
27	3994	231	Wf	β−5, ε−1	15
Aug					
1	3999	,,	,,	ε−1	15
4	4002	,,	,,	ε−1	15
8	4006	120	Bh	<x	<15
20	4018	231	Wf	<ε	<15
22	4020	,,	,,	ε−3	15
23	4021	,,	,,	ε−2	15
26	4024	,,	,,	ε−2	15
29	4027	,,	,,	ε−1	15
31	4029	,,	,,	ε−2·5	15
Sept					
2	4031	,,	,,	ε−2	15
4	4033	,,	,,	ε−2	15
5	4034	,,	,,	ε−2·5	15
19	4048	,,	,,	<ε	<15
24	4053	150	Bh	<x	<15
25	4054	231	Wf	ε−1	15
26	4055	,,	,,	ε−2	15
28	4057	,,	,,	ε−3	15
Oct					
4	4063	172	Ha	<x	<15
5	4064	231	Wf	ε−1	15
11	4070	150	Bh	=x	15
15	4074	120	,,	w−2, x−1	15
16	4075	231	Wf	=y, β+2·5, ε+6·5	14
23	4082	94	Ni	53 (5) v (1) w	15
23	4082	150	Bh	=w, =x	15
23	4082	M	Ph	59 (1) v (2) 61	14
25	4084	120	Bh	=x	15
26	4085	157	Wf	51−2, w+1	15
31	4090	120	Bh	=x	15
Nov					
3	4093	150	,,	w−1	15
3	4093	134	Sa	<53	<15
4	4094	94	Ni	=47, =53	15
4	4094	,,	Li	<51	<15
8	4098	90	Bh	=w	15
12	4102	193	Li	=53	15
15	4105	94	Ni	=47	15

July 6, Unsteady. Difficult.
July 7, Certain, but very difficult.
July 20, Difficult. Averted vision.
Aug. 4, Difficult.
Aug. 20, Doubtful.
Aug. 23, Sept. 26, Very difficult.
Aug. 31, Difficult.
Sept. 5, Glimpsed.
Sept. 19, Doubtfully glimpsed.
Sept. 28, Very difficult, but certain.
Oct. 23, Ni, Unsteady.
Nov. 3, Sa, Not visible.
Nov. 4, Li, Believed glimpsed.

(432) S CASSIOPEIÆ—*continued.*

1924 Nov						1924 Dec					
15	4105	90	Bh	35 (1) v (1) w	12·9	14	4134	90	Bh	35 (2) v (1) 47	12·5
17	4107	134	Sa	=47	12·7	14	4134	150	Bk	35−3, 47+2	12·5
19	4109	90	Bh	53−2	13·2	17	4137	,,	,,	41−2, =47, 52+3	12·7
24	4114	,,	,,	47−1	12·8	19	4139	90	Bh	27−5, 30−3, 35+1	12·2*b*
27	4117	150	,,	47−1	12·8	19	4139	,,	Sa	35−2, 47+2	12·5
28	4118	,,	Bk	=47	12·7	20	4140	150	Bk	=44, 47+1	12·6
29	4119	157	Wf	35−2, 47+2	12·5	22	4142	94	Ni	35 (2) v (2) 47	12·5
30	4120	193	Li	=47	12·7	22	4142	90	Bh	30 (1) v (2) 47, =35	12·2
Dec						24	4144	150	Bk	35−3, 47+2	12·5
2	4122	150	Bk	47−1, 53+2	12·8	26	4146	90	Bh	30 (1) v (1) 35	12·1*b*
4	4124	,,	Bh	=47	12·7	28	4148	,,	,,	35 (1) v (3) 47	12·4
6	4126	90	,,	=47	12·7	28	4148	94	Ni	=47	12·7
12	4132	150	Bk	47−0·5	12·7	30	4150	M	Ph	53+3	12·7*b*
13	4133	134	Sa	=47	12·7	30	4150	90	Bh	30−1	12·1
13	4133	90	Bh	47+1	12·6						

(107) T CASSIOPEIÆ. (V. 3.)

H.D. 001755.

Date.	Julian Date.	Inst.	Observer.	Comparisons.	Deduced Mag.	Date.	Julian Date.	Inst.	Observer.	Comparisons.	Deduced Mag.
1920 Jan						1920 July					
1	2325	94	Ni	2 (7·5) v (2·5) 5	7·7	10	2516	80	AB	31−3, 53+3	11·9
11	2335	,,	,,	2 (9) v (2·5) 5	7·7	11	2517	,,	,,	47−2·5, 53+2·5	12·2
14	2338	60	D	2−7, 5+1	7·9	13	2519	,,	,,	47−3, 53+2·5	12·3
23	2347	94	Ni	2 (10) v (2·5) 5	7·7	16	2522	,,	,,	47−2, 53+3	12·2
Feb						16	2522	94	Ni	31 (4) v (3) 43	11·6
3	2358	,,	,,	5+2	7·7	19	2525	120	D	31−2, 47+5	11·5*b*
15	2370	,,	,,	5+1	7·8	20	2526	80	AB	47−3, 53+4	12·2
17	2372	60	D	=5	7·9	27	2533	140	Mn	<31	<11·3
22	2377	94	Ni	5+0·5	7·8	27	2533	94	Ni	31 (4) v (2) 43	11·7
Mar						Aug					
8	2392	,,	,,	5 (3) v (2) 9	8·2	1	2538	65	Mn	=44	11·9
18	2402	60	D	10−3, 12+1	8·9	2	2539	80	AB	31−3	11·6*b*
28	2412	94	Ni	12 (4) v (4) 14	9·3*b*	3	2540	94	Ni	31 (5) v (2) 43	11·7
Apr						6	2543	80	AB	31−3, 53+3	11·9*b*
16	2431	,,	,,	12 (2) v (4) 14	9·2	8	2545	,,	,,	31−3, 53+2·5	11·9
May						13	2550	60	Mn	37 (1) v (1) 43	11·8
7	2452	60	D	k−4, 22+3	9·8*b*	15	2552	130	,,	31 (2) v (1) 37	11·6*b*
9	2454	94	Ni	12 (6) v (2) 14	9·5	20	2557	25	AB	31−3·5	11·7*c*
16	2461	,,	,,	=14	9·7	22	2559	60	Mn	20 (4) v (1) 28	10·9*b*
23	2468	,,	,,	14 (1) v (2) 20	9·9	23	2560	80	AB	47−2, 53+4	12·1*b*
June						26	2563	75	Gi	20−3, 28+2·5	10·8
8	2484	,,	,,	20−4, =31, 43+4	11·2	Sept					
9	2485	60	D	28−1, 31+2	11·1*b*	4	2572	60	Mn	=16	9·8*b*
22	2498	80	AB	47−1·5, 53+2·5	12·2*b*	6	2574	25	AB	31−1	11·4*c*
July						8	2576	60	D	31−1, 47+6	11·4
9	2515	94	Ni	31 (4) v (1·5) 43	11·7	9	2577	30	Co	<27	<10·8
9	2515	120	D	31−5, =47	11·9*b*	9	2577	75	Gi	20+2	10·3
						9	2577	94	Ni	20−2, =28, 31+2	11·0
						10	2578	60	Mn	16+3	9·5*b*

Jan. 1, With 22, 7·7.
Jan. 14, With 22, 7·8.
Jan. 23, With 22, 7·8.
Feb. 3, With 22, 7·9.
Feb. 15, With 22, 8·0.
June 9, Difficult.
July 9, D, About. Difficult.

July 19, Difficult.
July 27, Mn, Believe glimpsed. Est. 11·5 mag.
Aug. 20, Seeing poor.
Sept. 4, Reddish.
Sept. 9, Co, Invisible.

(107) T CASSIOPEIÆ—*continued.*

1920 Sept					
11	2579	30	Co	<28	<11·0
12	2580	80	AB	20−3·5, 28+1, 31+3	10·9
14	2582	,,	,,	20−5·5, 28+1, 31+3	11·0
16	2584	94	Ni	14 (1) v (4) 20	9·8*b*
19	2587	80	Co	=27	10·8*c*
19	2587	32	Mn	13+0·5	9·4
19	2587	80	AB	20−3, 28+2	10·8
22	2590	,,	,,	20−5, 28+2	10·9
23	2591	94	Ni	=9	8·4
24	2592	60	Co	=20	10·5*c*
25	2593	,,	,,	16−3, 21−1, 20+1	10·3
27	2595	32	Mn	12−2, 13+2	9·2*b*
28	2596	60	Co	16−2	10·0*c*
28	2596	75	Gi	16+3	9·5
Oct					
1	2599	60	Co	=21, 20+1	10·3*b*
3	2601	80	AB	20−4, 28+4	10·8
4	2602	,,	,,	20−5, 28+2	10·9
4	2602	94	Ni	12 (6) v (3) 14	9·4
6	2604	32	Mn	12−1·5, 13+3	9·1*b*
7	2605	60	Co	=21, 23+2	10·2*c*
8	2606	,,	,,	=21, 20+2	10·3*b*
10	2608	94	Ni	12 (2) v (5) 14	9·2
11	2609	30	D	12−3, k+1	9·3*b*
12	2610	60	Co	16−3, 21+1	10·1
13	2611	32	Mn	=12	9·0*b*
13	2611	80	AB	16−2, 20+3	10·1*b*
15	2613	,,	,,	16−1·5, 20+4·5	10·0
18	2616	94	Ni	12 (2) v (5) 14	9·2
19	2617	60	Co	16−1, 21+2	10·0
20	2618	32	Mn	10 (3) v (1) 12, 11+0·5	8·8
22	2620	80	AB	12−4.5, k+1, 16+4	9·4*b*
25	2623	,,	,,	12−2·5	9·2*c*
26	2624	75	Gi	10−3, 12+2	8·8
26	2624	60	Co	10−4, =12	9·0
27	2625	,,	,,	10−3, 12+1	8·9*b*
28	2626	94	Ni	9 (2·5) v (2·5) 12	8·7
28	2626	32	Mn	10 (1) v (1) 12, 11+1	8·7
29	2627	60	Co	10−4, 12+1	8·9
31	2629	80	AB	12−3, k+3	9·2
Nov					
3	2632	55	Bo	9 (3) v (1) 10	8·5
3	2632	32	Mn	=10	8·6*b*
4	2633	25	AB	12−1, k+3	9·1
4	2633	94	Ni	9 (1) v (5) 12	8·5
5	2634	60	Co	10−2, 12+2	8·8
6	2635	25	AB	10−5, k+1	9·2
7	2636	23	Bo	9 (1) v (3) 10	8·5
9	2638	60	Co	=5	7·9
10	2639	25	AB	10−2, k+2	9·0*c*
11	2640	60	Co	4−3, =5	7·9
11	2640	B	Mn	2 (1) v (1) 3	7·4*b*
13	2642	75	Gi	5−2, 10+2	8·2*b*
13	2642	60	Co	4−2, =5	7·9
1920 Nov					
15	2644	60	Co	5+1	7
16	2645	55	Bo	5 (1) v (3) 6	7
17	2646	B	Mn	2 (1) v (1) 3	7
17	2646	94	Ni	5−1	8
18	2647	30	D	5−3, 6+1	8
18	2647	60	Co	4−2, 5−0·5	7
19	2648	,,	,,	5−1	8
20	2649	55	Bo	3 (1) v (2) 4	7
24	2653	60	Co	5−1·5	8
Dec					
1	2660	,,	,,	5+0·5, 6+2	7
1	2660	25	AB	A−5	7
1	2660	94	Ni	5+1	7
2	2661	75	Gi	=6	8
3	2662	B	Mn	2 (1) v (2) 3	7
9	2668	...	Ms	10−3, =12	7
10	2669	60	Co	=5	7
12	2671	55	Bo	4 (3) v (1) 5	7
12	2671	B	Mn	2 (1) v (2) 3	7
13	2672	...	Ms	16+5	9
14	2673	60	Co	5−3, =7	8
21	2680	32	Mn	5−0·5	7
21	2680	80	Co	8−4, 10−1	8
22	2681	,,	,,	=12	9
27	2686	94	Ni	5 (1) v (4) 9	9
28	2687	...	Ms	16+6	9
28	2687	80	Co	=12	9
30	2689	25	AB	12−2, k+2	9
31	2690	...	Ms	16+5	9
31	2690	80	Co	12−1·5	9
1921 Jan					
1	2691	25	AB	10−3, 12+2	8
4	2694	75	Gi	10−1	8
5	2695	80	Co	12−2	9
6	2696	25	AB	10−2, 12+3	8
9	2699	80	Co	12−1, 13+3	9
9	2699	...	Ms	10 (1) v (1) 16	9
10	2700	37	Li	3 (6) v (4) 9, 5 (3) v (7) 10	8
12	2702	32	Mn	5 (1) v (2) 6	8
12	2702	80	Co	12−1, 13+2	9
13	2703	...	Ms	16+5	9
14	2704	94	Ni	5 (2) v (3) 9	9
14	2704	55	Bo	5 (3) v (1) 6	8
14	2704	37	Li	5 (3) v (7) 10, =6	8
15	2705	,,	,,	5 (3) v (7) 9, 5 (6) v (4) 10, =7	8
16	2706	25	AB	10−2, 12+4	8
16	2706	60	D	10−3, 12+2	8
17	2707	37	Li	5 (3) v (7) 10	8
19	2709	75	Gi	9−2, =10	8
22	2712	...	Ms	12−2	9
22	2712	80	Co	=12	9
27	2717	55	Bo	6 (3) v (1) 7	9
29	2719	25	AB	10−3, 12+3	9

Sept. 11, Invisible.
Sept. 19, Co, Too faint for accurate comparison.
Sept. 24, Difficult.
Sept. 25, Red.
Oct. 1, 8, Red.
Oct. 11, Difficult.
Oct. 12, Very red.
Oct. 19, Scarlet.
Oct. 29, Red.
Nov. 5, Dull red.
Nov. 18, Co, Orange.
Nov. 19, Ruby red.
Dec. 14, Orange.
Dec. 21, Mn, Orange. Co, About.
Dec. 22, Difficult.
Dec. 28, Co, About.
Jan. 5, Difficult.
Jan. 10, Li, Reddish.
Jan. 14, Li, Orange. Difficult.
Jan. 15, 17, Orange.
Jan. 22, Co, Reddish.

(107) T CASSIOPEIÆ—*continued.*

1921					
Jan					
30	2720	90	Bh	9−1, =10	8·6
31	2721	80	AB	10−3, 12+3	8·8
31	2721	55	Bo	7 (1) v (3) 8	8·2
31	2721	37	Li	5 (2) v (8) 10	8·0
Feb					
2	2723	,,	,,	5 (1) v (9) 10	7·9
2	2723	32	Mn	=5	7·9
2	2723	90	Bh	5−1	8·0
2	2723	60	Co	=7	8·2
3	2724	,,	,,	7−2, 10+2	8·4
3	2724	80	AB	10−3, 12+3	8·8
3	2724	60	Ms	=7, 10+2	8·3
4	2725	47	Gi	5−3·5, 9+2	8·2
5	2726	55	Bo	=5	7·9*b*
9	2730	90	Bh	=5	7·9
9	2730	60	Co	=5	7·9
12	2733	94	Ni	5 (2) v (4) 9	8·1
12	2733	25	AB	A−3, =10	8·6
14	2735	60	Co	5−3, =7	8·2
14	2735	37	Li	2 (8) v (2) 5	7·7
15	2736	80	AB	A−3, 10+2	8·5
16	2737	60	Ms	5−1	8·0
16	2737	,,	Co	5−0·5	7·9
17	2738	80	AB	A−2, 10+2	8·4
17	2738	47	Gi	4−4, 9+4	8·1
18	2739	90	Bh	=5, 6+2	7·9
19	2740	55	Bo	3 (3) v (1) 4	7·6
19	2740	94	Ni	=5	7·9
20	2741	25	AB	A+1	8·2
20	2741	60	Co	=5	7·9
20	2741	32	Mn	3 (3) v (1) 5	7·8
21	2742	60	Ms	=5	7·9
23	2744	25	AB	5−6·5, A+2	8·3
24	2745	55	Bo	3 (1) v (1) 4	7·6
24	2745	37	Li	3 (4) v (6) 7, =5	7·8*b*
25	2746	90	Bh	5+1	7·8
25	2746	60	Ms	5+1	7·8
25	2746	,,	Co	5+1·5	7·7
26	2747	,,	,,	5+1	7·8
Mar					
1	2750	,,	,,	=5	7·9
1	2750	47	Gi	=4	7·7
1	2750	37	Li	2 (5) v (5) 10, 3 (7) v (3) 7	7·9
2	2751	,,	,,	2 (8) v (2) 5, 3 (3) v (7) 7	7·7*b*
2	2751	94	Ni	5+1·5	7·7
2	2751	60	Ms	=5	7·9
2	2751	32	Mn	4 (1) v (1) 5	7·8
2	2751	90	Bh	5+2	7·7
2	2751	55	Bo	3 (1) v (3) 4	7·6
3	2752	80	AB	5−3, A+2	8·1
4	2753	,,	,,	5−4, A+2	8·2*b*
7	2756	55	Bo	3 (1) v (1) 4	7·6
7	2756	90	Bh	5+2	7·7

Jan. 31, Feb. 2, Li, Orange. Difficult.
Feb. 2, Co, Red.
Feb. 9, Bh, Orange. Co, Orange red.
Feb. 14, Li, Orange.
Feb. 16, Co, Orange red.
Feb. 18, Orange.
Feb. 20, Co, Orange red.
Feb. 24, Mar. 2, Li, Orange.
Feb. 25, 26, Co, Orange.
Mar. 1, Co, Li, Orange.

1921					
Mar					
7	2756	60	Co	5+1	7·8
8	2757	25	AB	5−5, A+3	8·2
10	2759	90	Bh	5+1	7·8
10	2759	60	Co	5+2	7·7
10	2759	94	Ni	=5	7·9
11	2760	80	AB	5−4, A+3	8·1
12	2761	55	Bo	3 (1) v (3) 4	7·6
14	2763	47	Gi	3−2, 4−1	7·7*b*
14	2763	45	Bh	=5	7·9
15	2764	55	Bo	2 (3) v (1) 3	7·4
17	2766	90	Bh	=4, 5+2	7·7
17	2766	60	Ms	5+1	7·8
17	2766	,,	Co	5+2	7·7
18	2767	,,	,,	5+0·5	7·8
18	2767	37	Li	1 (7) v (3) 4, 2 (4) v (6) 5, =3	7·5*b*
18	2767	32	Mn	=3	7·5*b*
19	2768	80	AB	5−4, A+3	8·1
20	2769	60	Co	=4, 5+3	7·6
20	2769	37	Li	2 (3) v (7) 5, =3	7·5*b*
20	2769	60	Ms	5+3	7·6
21	2770	55	Bo	=3	7·5
21	2770	45	Bh	=4, 5+1	7·7
24	2773	90	,,	5−2	8·1
24	2773	60	Co	=4, 5+3	7·6
24	2773	94	Ni	5+1·5	7·7
26	2775	60	Co	4+1, 5+3	7·6
27	2776	,,	,,	=4, 5+2	7·7
29	2778	,,	,,	5+2	7·7
29	2778	55	Bo	=3	7·5
30	2779	37	Li	2 (5) v (5) 5, =3	7·5
31	2780	60	Ms	5+3	7·6
Apr					
1	2781	,,	Co	=4, 5+1·5	7·7
1	2781	80	AB	5−4, A+3	8·1
1	2781	90	Bh	=5	7·9
1	2781	60	Ms	5+3	7·6
2	2782	37	Li	2 (5) v (5) 5, =3	7·6
3	2783	47	Gi	=4	7·7
3	2783	55	Bo	2 (3) v (1) 4	7·4
4	2784	37	Li	1 (8) v (2) 4, 2 (5) v (5) 5, =3	7·5*b*
4	2784	90	Mn	5+1·5	7·7
6	2786	80	Co	5−1	8·0*b*
7	2787	,,	,,	4−2, =5	7·9
7	2787	90	Bh	5−1	8·0
7	2787	37	Li	2 (5) v (5) 5, =3	7·5
7	2787	60	Ms	5−2	8·1
10	2790	80	Co	=5	7·9
12	2792	,,	,,	5−2, =7	8·1
12	2792	55	Bo	3 (1) v (2) 4	7·6
14	2794	60	Ms	5−4, 7−1	8·3
15	2795	,,	,,	9 (1) v (1) 10	8·5
15	2795	94	Ni	5+0·5	7·8
15	2795	90	Bh	5−3, 10+4	8·2
16	2796	80	Co	5−3	8·2
19	2799	,,	,,	5−3, 7−1	8·2
23	2803	,,	,,	5−1	8·0
28	2808	60	Ms	9 (1) v (1) 10	8·5
28	2808	32	Mn	5+1	7·8*b*
28	2808	37	Li	2 (8) v (2) 5, 3 (2) v (8) 6	7·7

Mar. 7, 17, 20, Co, Orange.
Mar. 10, Co, Red.
Mar. 24, 26, 27, 29, Co, Orange.
April 1, 7, Co, Orange.
April 1, 7, 14, 15, 28, Ms, t.

(107) T CASSIOPEIÆ—*continued.*

1921					
Apr					
28	2808	90	Bh	5−4, =6, 10+4	8·2
29	2809	94	Ni	5−0·5	7·9
30	2810	37	Li	3 (5) v (5) 5	7·7
May					
1	2811	,,	,,	2 (8) v (2) 5, 3 (3) v (7) 6	7·7
7	2817	90	Bh	5−5, =6	8·3
8	2818	37	Li	2 (8) v (2) 5, 3 (5) v (5) 6	7·8*b*
9	2819	32	Mn	=5	7·9
10	2820	55	Bo	5 (1) v (1) 6	8·0*b*
16	2826	90	Bh	5−5, 10+2	8·4*b*
19	2829	94	Ni	5 (4) v (3) 9	8·2
20	2830	55	Bo	5 (1) v (3) 6	7·9
23	2833	37	Li	5 (5) v (5) 6	8·0
24	2834	90	Bh	=10	8·6*b*
31	2841	,,	,,	10−1	8·7*b*
31	2841	60	D	10−2, 12+3	8·7
June					
1	2842	55	Bo	7 (1) v (1) 8	8·3
1	2842	32	Mn	6−1, 7 (1) v (1) 8, 9+1	8·3
2	2843	90	Bh	10−2, 12+3	8·7
6	2847	120	,,	10−3	8·9
6	2847	94	Ni	5 (3) v (2) 9	8·2
6	2847	60	D	10−2, 12+2	8·8
7	2848	47	Gi	10−3, 12+1·5	8·8*b*
12	2853	37	Li	6 (5) v (5) 12, =10	8·6*b*
14	2855	55	Bo	8 (1) v (1) 9	8·4
15	2856	32	Mn	10 (1) v (4) 11	8·6*b*
16	2857	60	D	10−4, 12+2	8·9*b*
21	2862	47	Gi	=12	9·0
23	2864	37	Li	10 (5) v (5) 12	8·8
24	2865	60	D	=12	9·0*b*
27	2868	90	Bh	10−4, =12	9·0
27	2868	37	Li	10 (5) v (5) 12	8·8
29	2870	60	D	12−3, k+1	9·3
30	2871	32	Mn	=12	9·0
July					
1	2872	47	Gi	12−2, 16+5	9·2
2	2873	94	Ni	12 (3) v (3) 14	9·3
2	2873	90	Bh	10−6, 12−3	9·2
7	2878	,,	,,	10−10, =13	9·5
9	2880	80	AB	16−3, 20+1	10·3
9	2880	60	D	16−1, 22+2	9·9*b*
10	2881	94	Ni	12 (6) v (2·5) 14	9·5
14	2885	47	Gi	12−6, 16+2	9·6
22	2893	80	AB	20−4, 28+3	10·8
23	2894	120	Bh	13−5	9·9
24	2895	60	D	20−4, 28+1	10·9*b*
26	2897	,,	,,	20−3, 28+2	10·8*b*
26	2897	90	Bh	21−2, 20+1	10·4
27	2898	80	AB	20−4, 28+3	10·8
28	2899	47	Gi	=16	9·8
31	2902	60	D	28+0·5, 31+5	10·9*b*
31	2902	80	Co	=31	11·3
31	2902	32	Mn	16 (2) v (3) 21	10·0*b*
31	2902	80	AB	=28, 31+4	11·0
Aug					
1	2903	,,	,,	20−4, =28, 31+5	10·9
3	2905	60	D	28−2, 31+2	11·2*b*
4	2906	32	Ca	23−1, 20+1	10·4
1921					
Aug					
5	2907	80	AB	28−1, 31+4	11·0
6	2908	90	Bh	21−5, =20	10·6
8	2910	80	Co	=31	11·3
9	2911	32	Mn	=21, =20	10·2
15	2917	90	Bh	20−6	11·1
17	2919	75	Gi	=20, 28+3·5	10·6
18	2920	94	Ni	20 (3) v (3) 31	10·6
18	2920	55	Bo	20 (1) v (3) 27	10·6
24	2926	,,	,,	27 (1) v (1) 28	10·6
25	2927	90	Bh	43+1, =44	11·6
26	2928	120	D	28−3, 31+1	11·3
28	2930	94	Ni	20 (4) v (2) 31	11·1
30	2932	60	D	28−3, 31+1	11·3
31	2933	90	Bh	43−2, 49+4	12·2
31	2933	160	Bo	31 (1) v (3) 37	11·4
Sept					
1	2934	47	Gi	28−2, 31+1	11·2
1	2934	60	D	=31	11·3
3	2936	80	Co	43+2	11·6
5	2938	55	Bo	31 (1) v (3) 37	11·4
5	2938	90	Bh	49+2	12·5
6	2939	94	Ni	31 (1·5) v (3) 43	11·5
7	2940	80	Co	=43	11·6
7	2940	60	D	31−1, 37+4	11·4
7	2940	120	Bh	=49	12·6
7	2940	80	Ca	39−2, 44+1	11·8
10	2943	90	Bh	43−6, 49+2	12·5
16	2949	,,	,,	49+2	12·5
21	2954	160	Bo	44 (1) v (1) 47	12·6
21	2954	83	Li	=53	12·4
23	2956	100	Co	31−2	11·5
23	2956	94	Ni	31 (3) v (2) 43	11·5
24	2957	60	D	=37	11·8
24	2957	90	Bh	43−5, =49	12·6
26	2959	120	,,	49−1	12·8
26	2959	160	Bo	43 (1) v (1) 44	11·6
27	2960	200	Co	31−1, =37	11·6
28	2961	60	D	37−1, 47+2	11·6
28	2961	90	Bh	43−5, 49+1	12·5
29	2962	83	Li	=53	12·4
Oct					
1	2964	160	Bo	43 (1) v (1) 44	11·6
2	2965	117	Gi	31−2, 37+2·5, 43+4	11·5
4	2967	83	Li	=53	12·4
5	2968	,,	,,	53 (5) v (5) 55	12·7
6	2969	160	Bo	44 (1) v (3) 47	12·6
6	2969	80	Co	=43	11·6
6	2969	,,	Ca	37−1, 44+1	11·6
6	2969	90	Bh	43−4	12·5
8	2971	,,	,,	43−2	12·1
9	2972	,,	,,	=43	11·6
9	2972	60	D	31−2, 37+3	11·5
9	2972	94	Ni	31 (3·5) v (1·5) 43	11·7
15	2978	160	Bo	31 (4) v (1) 37	11·7
17	2980	90	Bh	=31	11·3
21	2984	160	Bo	37 (1) v (1) 43	11·8
23	2986	83	Li	43 (5) v (5) 53	12·2
23	2986	90	Bh	29−1, 31+2	11·6
24	2987	80	Co	=43	11·6
27	2990	90	Bh	31+1	11·2

June 2, Yellow.
June 6, Bh, Yellow tinge.
June 24, July 9, 26, D, Difficult.
July 31, Co, About. Only just visible.

Sept. 3, About.
Sept. 23, 27, Co, 10-in. mirror.
Sept. 24, D, About. Difficult.
Oct. 9, D, Difficult.
Oct. 24, About.

(107) T CASSIOPEIÆ—*continued.*

1921					
Oct					
29	2992	160	Bo	=37	11·8
31	2994	117	Gi	31−1·5, 43+4	11·5
31	2994	45	Bh	31+1	11·2
Nov					
2	2996	94	Ni	31 (3) v (2) 43	11·7
5	2999	80	Ca	39−2, 44+1	11·8
6	3000	160	Bo	37 (1) v (2) 47	11·9*b*
7	3001	90	Bh	31+1	11·2
12	3006	,,	,,	31+1	11·2
17	3011	140	Bo	31 (1) v (1) 37	11·6*b*
18	3012	80	Ca	=37, 44+1	11·8
19	3013	140	Bo	31 (3) v (2) 37	11·6*b*
22	3016	94	Ni	31 (2·5) v (2·5) 43	11·6
22	3016	90	Bh	=31	11·3
22	3016	140	Bo	28 (2) v (1) 31	11·2
24	3018	90	Bh	31+1	11·2
24	3018	60	D	31−2	11·5*b*
25	3019	117	Gi	28−1, 31+2	11·1*b*
25	3019	140	Bo	28 (1) v (2) 31	11·1
30	3024	94	Ni	31+0·5	11·3
Dec					
3	3027	83	Li	28 (5) v (5) 31	11·2
3	3027	90	Bh	20−1, 27+1	10·6
13	3037	45	,,	=20	10·5
15	3039	90	,,	16−6, =20, 27+3	10·5
17	3041	55	Bo	12 (3) v (1) 13	9·3
21	3045	90	Bh	16−4, 20+2	10·3
22	3046	83	Li	10 (5) v (5) 20, 12 (3) v (7) 18	9·4
23	3047	45	Bh	=16	9·8
25	3049	90	,,	10−9, 16+3	9·5
25	3049	80	Co	20−2·5, 28+2·5	10·8
25	3049	94	Ni	12 (7·5) v (1·5) 14	9·5
26	3050	55	Bo	12 (1) v (2) 13	9·1
27	3051	75	Gi	12−5, 16+2·5	9·5
28	3052	83	Li	10 (7) v (3) 16	9·4
28	3052	80	Co	20−3, 28+2	10·8
29	3053	,,	,,	20−1, 27+3	10·5*b*
30	3054	,,	,,	=20	10·5*b*
30	3054	90	Bh	10−3	8·9
1922					
Jan					
1	3056	45	,,	=10	8·6
2	3057	...	Sa	10−10, 12−6, 16+3, 22+5	9·6
3	3058	t	Co	=13, =14, 16+3	9·5
3	3058	27	Li	12 (2) v (8) 13	9·1
3	3058	90	Bh	10+1	8·5
7	3062	75	Gi	12 (2) v (5) 16	9·2
8	3063	90	Bh	10+2	8·4
14	3069	94	Ni	9 (3) v (2) 12	8·8
17	3072	t	Co	13+2, 14+4	9·2*b*
18	3073	90	Bh	10+1	8·5
19	3074	75	Gi	10 (2·5) v (1·5) 12	8·8*b*
20	3075	27	Li	10 (2) v (8) 11	8·6
20	3075	90	Bh	10+3	8·3
22	3077	...	Sa	5−12, 10−8, =12, 16+3	9·2
28	3083	t	Co	12−2, 13+3	9·2*b*
29	3084	90	Bh	6−2, =9, 10+2	8·4
Feb					
1	3087	t	Co	=12	9·0
1	3087	...	Sa	5−6, 10−3, 12+1, 16+8, 22+10	8·9
2	3088	32	Ca	9−1, 10+1	8·5*b*
2	3088	45	Bh	3−6, =7, 9+3	8·2
5	3091	90	,,	5−2	8·1
9	3095	94	Ni	=14	9·7
10	3096	90	Bh	5−3, 9+3	8·2
10	3096	t	Co	10−2, 12+1	8·8
12	3098	60	D	10−1, 12+3	8·7*b*
13	3099	t	Co	10−2	8·8
14	3100	75	Gi	9 (0·5) v (1) 10	8·5
17	3103	27	Li	5 (3) v (7) 6	8·0
17	3103	90	Bh	5−5, 10+2	8·4
18	3104	...	Sa	5−5, 6−3, 10−2, 12+2	8·6
18	3104	t	Co	10−1, 12+3	8·7
20	3106	,,	,,	10−1·5	8·7*b*
20	3106	27	Li	5 (2) v (8) 6	7·9
25	3111	94	Ni	5 (2·5) v (2) 9	8·2
27	3113	t	Co	10−2	8·8*b*
27	3113	27	Li	5 (2) v (8) 6	7·9
28	3114	45	Bh	5−4, 10+4	8·2*b*
Mar					
1	3115	t	Co	=12	9·0
4	3118	,,	,,	10−1·5	8·7
4	3118	90	Bh	5−4, 9+2	8·3
4	3118	...	Sa	5−4, 6−2, 10−1, 12+6	8·4
4	3118	75	Gi	5 (3) v (2) 10	8·3
7	3121	t	Co	10−3, =12	8·9
10	3124	,,	,,	10−2, 12+1	8·8
10	3124	...	Sa	6−4, 10−1, 12+1	8·7
12	3126	t	Co	10−1·5, 12+1·5	8·8
16	3130	45	Bh	=9, 10+3	8·4
18	3132	32	Ca	=9	8·4*b*
18	3132	94	Ni	5 (3) v (2) 9	8·2
18	3132	47	Gi	6 (2) v (1) 10	8·4
19	3133	90	Bh	=9, 10+3	8·4
20	3134	t	Co	10−1	8·7*b*
21	3135	...	Sa	5−7, 6−3, 10−1, 12+3, 16+8	8·7
23	3137	t	Co	10−1·5	8·7
28	3142	,,	,,	10−1·5	8·7
28	3142	90	Bh	9−2, =10	8·6
31	3145	,,	,,	=10	8·6
31	3145	94	Ni	5 (2) v (2·5) 9	8·1
31	3145	t	Co	10−1	8·7
31	3145	...	Sa	5−10, 6−6, 10−2, =12, 16+5	8·9*b*
Apr					
2	3147	t	Co	10−1	8·7
4	3149	90	Bh	=9, 10+2	8·4
11	3156	t	Co	5−2	8·1
15	3160	75	Gi	6 (2·5) v (2) 10	8·4
17	3162	...	Sa	5−6, 10−3, 12+3	8·7
18	3163	90	Bh	5−4, =6	8·2*b*
19	3164	94	Ni	=9	8·4
19	3164	t	Co	5−2	8·1
21	3166	,,	,,	5−1·5, =6	8·1

Dec. 22, Slightly orange.
Dec. 28, Li, Slightly orange.
Jan. 7, 7c.
Jan. 19, 6c.

Feb. 10, Co, Dull orange.
Feb. 14, 5c.
Feb. 17, Li, Orange. Difficult.
Feb. 20, 27, Li, Orange.
Mar. 18, Gi, 6c.
April 15, 6c.
April 21, Red.

(107) T CASSIOPEIÆ—*continued.*

1922					
Apr					
23	3168	90	Bh	9+5, 10+5	8·0*b*
24	3169	...	Sa	6−4, 10−2, 12+2, 16+10	8·7
27	3172	t	Co	5−1·5, =6	8·1
May					
3	3178	90	Bh	5−3, 9+3	8·2
5	3180	t	Co	5−2, 7+1	8·1
6	3181	90	Bh	9+5, 10+5	8·0
12	3187	t	Co	=5	7·9
14	3189	,,	,,	4−2·5, 5−0·5	7·9
17	3192	,,	,,	5−3, =7	8·2
17	3192	90	Bh	5−3, 9+3	8·2
17	3192	75	Gi	6 (1) v (2) 10	8·3*b*
21	3196	t	Co	=4, 5+2	7·7
23	3198	...	Sa	5−4, 10+4	8·2
24	3199	32	Ca	4−1, 5+0·5	7·8*b*
24	3199	94	Ni	=5	7·9
24	3199	t	Co	=5	7·9*b*
26	3201	90	Bh	5−1, 10+6	8·0
26	3201	...	Sa	2−8, 5−1, =6, 10+3, 12+8	8·1
27	3202	t	Co	4−1·5, 5+1	7·8
28	3203	75	Gi	5 (1) v (2·5) 6	8·0
28	3203	31	D	=5	7·9
29	3204	94	Ni	5+1	7·8
31	3206	90	Bh	=5, 9+5	7·9
June					
5	3211	...	Sa	b−10, c−7, 2−3, 5+4, 6+6	7·5
12	3218	45	Bh	=4	7·7
14	3220	75	Gi	5+1·5	7·7
15	3221	t	Co	=4, 5+3	7·6*b*
20	3226	,,	,,	4+1·5, 5+3·5	7·5
25	3231	,,	,,	4+2, 5+4	7·5
25	3231	...	Sa	b−8, c−6, =2, 5+3, 6+6	7·4
26	3232	45	Bh	4+2	7·5
28	3234	75	Gi	2 (5) v (1·5) 5	7·7
29	3235	45	Bh	4+2, 5+4	7·5
29	3235	t	Co	2−2, 4+2	7·5
July					
3	3239	,,	,,	2−3, 4+3	7·5*b*
4	3240	32	Ca	2−1, 3+2	7·3*b*
10	3246	45	Bh	4+3, 5+4	7·4
10	3246	75	Gi	3−1, 5+2·5	7·6
11	3247	t	Co	2−3, 5+4	7·5
11	3247	...	Sa	2−3, 5+3, 6+4, 10+6	7·7
12	3248	94	Ni	5+4·5	7·6
18	3254	t	Co	2−3, 5+4	7·5*b*
20	3256	,,	,,	4+2·5	7·4
20	3256	45	Bh	=3, =4, 5+5	7·5
21	3257	...	Sa	b−8, c−4, 2−2, 5+4, 6+6	7·4
26	3262	75	Gi	3 (1·5) v (1·5) 5	7·7*b*
27	3263	90	Bh	5+5	7·4
30	3266	t	Co	4+1, 5+3·5	7·6

May 5, Red. May 17, 28, Gi, 6c.
June 14, 7c.
June 20, Orange yellow.
June 25, Co, Orange.
June 28, 6c.
June 29, July 3, 11, Co, Orange red.
July 10, Gi, 4c·5.
July 12, With 22, 7·7.
July 18, Difficult.
July 26, 6c.

1922					
Aug					
5	3272	90	Bh	5+5	7
7	3274	94	Ni	5+3	7
8	3275	t	Co	4+0·5, 5+3	7
12	3279	90	Bh	5+3	7
15	3282	t	Co	4−1, 5+2	7
16	3283	32	Ca	=9	8
17	3284	80	Co	5+1·5	7
17	3284	94	Ni	5+1	7
18	3285	117	Gi	5−1·5	8
18	3285	90	Bh	5+2	7
19	3286	30	Co	4−2, =5	7
23	3290	,,	,,	4−2·5, =5	7
25	3292	45	Bh	3−2, 5+2	8
26	3293	...	Sa	5−1, =6, 10+2, 12+5	8
27	3294	94	Ni	5+1	7
27	3294	30	Co	5−1, =7	8
31	3298	,,	,,	5−2, =7	8
31	3298	90	Bh	5+1	7
Sept					
3	3301	31	D	5−0·5	8
4	3302	45	Bh	=5, =6	8
7	3305	32	Ca	8 (2) v (1) 10	8
9	3307	34	Li	5 (5) v (5) 6	8
10	3308	94	Ni	5+1	7
11	3309	30	Co	10−2, =12	8
12	3310	45	Bh	5−5, 6−3	8
13	3311	30	Co	12−2	8
14	3312	32	Ca	10 (1) v (2) 11	8
15	3313	34	Li	8 (5) v (5) 10	8
15	3313	...	Sa	2−12, 5−7, 6−3, =10, 12+4	8
15	3313	30	Co	12−3, 13+1	8
18	3316	94	Ni	9 (2) v (1·5) 12	8
18	3316	90	Bh	=10, =11	8
20	3318	30	Co	13−2, =14	8
22	3320	34	Li	7 (5) v (5) 10	8
22	3320	117	Gi	12−1	8
24	3322	30	Co	13−2, =14	8
29	3327	,,	,,	=13	8
29	3327	34	Li	10 (5) v (5) 12	8
29	3327	32	Ca	12 (2) v (3) 13	8
30	3328	45	Bh	12−3, 16+6	8
Oct					
4	3332	90	,,	12−6, 14+2	8
6	3334	,,	,,	12−5	8
6	3334	34	Li	9 (9) v (1) 11, 10 (8) v (2) 12	8
7	3335	94	Ni	12 (5) v (4) 14	8
8	3336	30	Co	13+1	8
10	3338	34	Li	12 (5) v (5) 13	8
11	3339	30	Co	=14	8
12	3340	34	Li	12 (5) v (5) 13	8
13	3341	62	D	k−4, 22+2·5	8
14	3342	34	Li	12 (3) v (7) 13	8
14	3342	90	Bh	9−10, 10−9, 16+3	8
14	3342	30	Co	=13, 14+1·5	8
14	3342	...	Sa	10−10, 12−5, 22+2, 20+10	8
16	3344	34	Li	12 (3) v (7) 13	8
18	3346	,,	,,	12 (3) v (7) 13	8
20	3348	,,	,,	12 (5) v (5) 13	8

Aug. 7, With 22, 7·8.
Aug. 18, Gi, 6c.
Sept. 11, 8c.
Sept. 22, Gi, 6c.

(107) T CASSIOPEIÆ—*continued.*

1922 Oct 22	3350	94	Ni	12 (7) v (1) 14	9·6
23	3351	34	Li	12 (7) v (3) 13	9·3
25	3353	90	Bh	16−2	10·0
26	3354	30	Co	=13	9·4*b*
27	3355	34	Li	12 (5) v (5) 13	9·2
Nov 1	3360	,,	,,	=13	9·4
1	3360	90	Bh	16−6, =20	10·5
4	3363	...	Sa	16−1, 22−3, 20+7, 31+10	10·1
5	3364	75	Gi	16+1·5	9·7
6	3365	34	Li	=14	9·7*b*
8	3367	80	Co	=27	10·8
9	3368	94	Ni	20 (3) v (2) 31	11·0
10	3369	34	Li	=16	9·8*b*
13	3372	80	Co	27−3	11·1*b*
14	3373	90	Bh	20−5, =30, 32+3	11·0
15	3374	94	Ni	20 (5) v (1·5) 31	11·1
19	3378	90	Bh	20−10, 27−6	11·4*b*
23	3382	80	Ca	=35, 31+1	11·2
24	3383	90	Bh	43+1, 47+5	11·7
24	3383	...	Sa	=31, 47+7	11·3
26	3385	94	Ni	=31	11·3
30	3389	117	Gi	20 (2·5) v (1) 28	10·9
Dec 6	3395	94	Li	=43	11·9
6	3395	90	Bh	43+1, 47+2	11·8*b*
11	3400	,,	,,	=47	12·1*b*
14	3403	94	Ni	31 (2) v (2) 37	11·6
14	3403	...	Sa	20−4, 28−4, =31, 47+5	11·3
17	3406	80	Ca	32 (2) v (3) 43	11·5
17	3406	90	Bh	=47	12·1
19	3408	80	Co	31−3	11·6*b*
19	3408	193	Li	27 (7) v (3) 31, =31	11·2
20	3409	94	Ni	31 (3) v (1) 37	11·7
22	3411	193	Li	=44	11·9
25	3414	...	Sa	31−8, 47+2	12·0
25	3414	90	Bh	47−1	12·2
28	3417	,,	,,	47−1	12·2
1923 Jan 3	3423	193	Li	43 (2) v (8) 47	11·9
3	3423	...	Sa	27−10, 28−10, =31, 47+3, 53+10	11·7
4	3424	90	Bh	47−1	12·2
6	3426	94	Ni	31 (4) v (2) 43	11·7
11	3431	90	Bh	31−2	11·5
14	3434	94	Ni	31 (5) v (1) 43	11·8
14	3434	90	Bh	31+2	11·1
14	3434	193	Li	44 (5) v (5) 47	12·0
14	3434	80	Ca	31−4, =37	11·8
20	3440	193	Li	=31	11·3
20	3440	90	Bh	31+4	10·9
21	3441	...	Sa	31−4, =47, 54+10	11·9
27	3447	90	Bh	37+4, 43+5	11·4
30	3450	,,	,,	=31	11·3
Feb 3	3454	45	,,	=31	11·3
3	3454	...	Sa	=31, 47+5	11·4
5	3456	193	Li	44 (4) v (6) 47	12·0
6	3457	94	Ni	31 (3) v (2) 37	11·6
8	3459	90	Bh	=31	11·3
9	3460	80	Ca	29 (2) v (3) 31	11·0
1923 Feb 13	3464	94	Ni	31 (2) v (2) 37	11·6
16	3467	90	Bh	21−10, 26−6, 31+1	11·2
23	3474	,,	,,	=20, 26+1	10·5
25	3476	,,	,,	21−2, 26+1	10·4
26	3477	94	Ni	=31	11·3
Mar 2	3481	...	Sa	=27	10·8
2	3481	90	Bh	21−7, 27−4	11·0
5	3484	80	Co	=28	11·0*b*
9	3488	,,	Ca	20 (2) v (1) 27	10·7
13	3492	90	Bh	=26, 32+5	10·6*b*
17	3496	,,	,,	16−6, 21−2	10·4
17	3496	...	Sa	16−2, =20, 21+2, 28+4	10·3
17	3496	94	Ni	=14	9·7
18	3497	80	Co	16−2, 21+2	10·0*b*
19	3498	117	Gi	12 (5·5) v (2) 16	9·6
21	3500	45	Bh	=21, 31+10	10·3*b*
24	3503	...	Sa	22−2, =26, 28+2	10·6
25	3504	90	Bh	=21	10·2
26	3505	80	Co	=21	10·2*b*
27	3506	90	Bh	=26	10·6
Apr 1	3511	,,	,,	=21	10·2
3	3513	94	Ni	12 (7) v (4) 14	9·4
4	3514	80	Co	=16, 19+2	9·8*b*
5	3515	75	Gi	12 (2·5) v (3·5) 16	9·3*b*
7	3517	94	Ni	12 (4) v (3) 14	9·4
9	3519	90	Bh	16+2, 21+6	9·6
13	3523	,,	,,	=10	8·6
14	3524	80	Co	12 (2) v (1) 13	9·3*b*
17	3527	90	Bh	16+5	9·3
19	3529	...	Sa	10−3, =12, 22+10	9·0
20	3530	94	Ni	9−4, =12	8·9
22	3532	45	Bh	16+8	9·0
23	3533	...	Sa	7−3, =8, 10−2, =12	8·6
May 1	3541	75	Gi	10 (2·5) v (2·5) 12	8·8
1	3541	...	Sa	9−3, =10, 12+2	8·7
3	3543	80	Co	10−3·5, =12	8·9
5	3545	94	Ni	5 (4·5) v (0·5) 9	8·4
7	3547	90	Bh	16+7	9·1
11	3551	80	Co	10−4, =12	9·0
12	3552	...	Sa	=9, 10−3, 12+2	8·7
14	3554	60	D	=10	8·6
17	3557	45	Bh	10−6, 16+6	9·2
20	3560	94	Ni	9−3, =12	8·9
25	3565	60	D	10−2, 12+2	8·8*b*
June 2	3573	90	Bh	7−2, 9+1	8·4
6	3577	60	D	10−2, 12+2	8·8*b*
10	3581	34	Li	5 (3) v (7) 6	8·0
11	3582	45	Bh	=7, =9	8·3*b*
11	3582	...	Sa	9−1, 10−1, =12	8·7
13	3584	75	Gi	10 (1·5) v (2) 12	8·7
21	3592	80	Co	5−3	8·2
23	3594	90	Bh	5+1	7·8
26	3597	60	D	10−1, 12+3	8·7
30	3601	75	Gi	10 (1) v (3) 12	8·7
July 4	3605	60	D	6−3, 10+1	8·5
5	3606	94	Ni	5 (3·5) v (1) 9	8·3
5	3606	80	Co	5−4, =10	8·4

Nov. 10, Very red. Difficult.
Dec. 19, Co, Just visible.

Mar. 5, 26, About.
April 13, June 2, Orange.
May 25, Difficult.

(107) T CASSIOPEIÆ—*continued.*

1923					
July					
5	3606	90	Bh	5+2	7·7*b*
6	3607	...	Sa	5−4, =10	8·4
8	3609	34	Li	=5	7·9
10	3611	94	Ni	5 (4) v (1) 9	8·3
11	3612	80	Co	10−2, 12+1	8·8
12	3613	32	Ca	9−2, 10 (1) v (2) 11	8·6
13	3614	60	D	6−4, 10+1	8·5
14	3615	90	Bh	3−1, 5+3	7·6
16	3617	60	D	=10	8·6
18	3619	...	Sa	5−6, 7−3, 10+1, 12+3	8·5
20	3621	90	Bh	3−3, 5+1	7·8
20	3621	80	Co	5−2	8·1
20	3621	60	D	6−4, 10+1	8·5
25	3626	34	Li	4 (5) v (5) 5	7·8
26	3627	...	Sa	5−1, 8+4, =9, 10+2	8·2
27	3628	94	Ni	=9	8·4
30	3631	90	Bh	=5	7·9
Aug					
1	3633	...	Sa	5−2, 6+3, =7, =9, 10+2	8·2
1	3633	90	Bh	=5	7·9
2	3634	80	Co	5−2	8·1
3	3635	94	Ni	5 (3) v (3) 9	8·2
3	3635	90	Bh	5+1	7·8
4	3636	80	Co	5−0·5	7·9
7	3639	,,	,,	=5	7·9
7	3639	32	Ca	=5	7·9
9	3641	45	Bh	5+2	7·7
11	3643	...	Sa	5−1, 6+1	8·0
11	3643	60	D	6+0·5	8·1
15	3647	90	Bh	5+2	7·7
15	3647	...	Sa	=5, 6−1, =7, =9	8·2
15	3647	80	Co	5+1	7·8
21	3653	,,	,,	5+2	7·7
22	3654	...	Sa	2−7, 4−3, 5+1, 6+4	7·9
22	3654	90	Bh	5+2	7·7
26	3658	80	Co	4−1, 5+1	7·8
28	3660	90	Bh	5+2	7·7
28	3660	...	Sa	=3, 4−2, 5+4, 6+5	7·6
30	3662	...	,,	3−2, 4−1, 6+5	7·7
30	3662	80	Co	=4, 5+2	7·7
31	3663	90	Bh	5+2	7·7
Sept					
1	3664	...	Sa	3−2, 4−3, 5+2, 6+3, 9+4	7·9
2	3665	60	D	5−2, 6+2	8·0
2	3665	94	Ni	5+3	7·6
3	3666	80	Co	4+1, 5+3	7·6
4	3667	90	Bh	=4, 5+2	7·7
5	3668	32	Ca	4 (1) v (1) 5	7·8
6	3669	80	Co	=4, 5+3	7·6
7	3670	45	Bh	=4, 5+2	7·7
9	3672	94	Ni	5+3·5	7·5
10	3673	150	Bh	5+3	7·6
11	3674	60	D	=5	7·9
11	3674	80	Co	=4, 5+2	7·7
13	3676	,,	,,	=4, 5+3	7·6

Sept. 2, D, 7c. Ni, With 22, 7·9.
Sept. 4, Yellow.
Sept. 7, 10, Yellow.
Sept. 9, 18, Ni, With 22, 7·9.
Sept. 13, Co, Rich orange.

1923					
Sept					
13	3676	45	Bh	4+1, 5+3	
15	3678	...	Sa	2−4, 4−2, 5+3, 6+2	
15	3678	80	Co	4+0·5, 5+3·5	
16	3679	90	Bh	5+2	
18	3681	60	D	2−5, 5+1	
18	3681	94	Ni	5+2·5	
21	3684	80	Co	5+2	
22	3685	...	Sa	3−1, 4+1	
22	3685	90	Bh	=3, 4+1, 5+3	
23	3686	32	Ca	4 (1) v (1) 5	
26	3689	90	Bh	5+3	
28	3691	80	Co	=5	
28	3691	34	Li	3 (8) v (2) 4	
29	3692	...	Sa	3−2, =5, 6+3	
30	3693	30	Co	5+1·5	
30	3693	32	Ca	4 (1) v (1) 5	
30	3693	60	D	5+1	
30	3693	94	Ni	5+1	
Oct					
2	3695	...	Sa	2−4, =3, 5+1	
4	3697	90	Bh	5+2	
7	3700	,,	,,	5+1	
8	3701	30	Co	5+1	
11	3704	90	Bh	5+1	
11	3704	...	Sa	5−2, 10+3	
12	3705	94	Ni	5+4	
14	3707	30	Co	4−0·5, 5+3	
15	3708	60	D	2−4, 5+1	
15	3708	32	Ca	4 (1) v (1) 5	
17	3710	80	Co	5+3·5	
23	3716	...	Sa	3−5, 5+1, =6	
23	3716	90	Bh	5−1	
26	3719	32	Ca	3 (3) v (3) 6	
26	3719	80	Co	4−3, 5+0·5	
27	3720	90	Bh	3−5, 5−2	
29	3722	80	Co	=5	
29	3722	60	D	6−2, 10+2	
Nov					
2	3726	80	Co	5−1·5	
3	3727	90	Bh	5+1	
4	3728	94	Ni	5 (1) v (4) 9	
6	3730	...	Sa	6−2, 9+2, 10+1	
7	3731	90	Bh	5−4, =7, 9+1	
7	3731	30	Co	=5	
7	3731	60	D	6−4, 10+1	
8	3732	32	Ca	=5	
11	3735	90	Bh	5−5	
16	3740	...	Sa	9−4, =10, 12+6	
16	3740	94	Ni	5 (4) v (1) 9	
17	3741	30	Co	5−2	
17	3741	90	Bh	5−5, 10+1	
22	3746	32	Ca	7 (1) v (1) 9	
30	3754	80	Co	12−3	
30	3754	45	Bh	=10	
Dec					
2	3756	90	,,	5−10, 10−2	
3	3757	...	Sa	10−6, 12−2, 17+5, 22+8	
4	3758	32	Ca	10 (2) v (1) 11	
4	3758	90	Bh	9−3, 10−1	
9	3763	,,	,,	10−2	
9	3763	80	Co	13+2	
9	3763	60	D	12−1, k+3	

Sept. 16, Yellow.
Sept. 30, Ni, With 22, 8·0.
Oct. 12, With 22, 7·9. Oct. 15, D, 7c.

(107) T CASSIOPEIÆ—*continued.*

1923 Dec					
9	3763	94	Ni	9 (4) v (1) 12	8·9
11	3765	32	Ca	12 (2) v (2) 13	9·2
15	3769	80	Co	13+2	9·2*b*
18	3772	,,	,,	=13	9·4*b*
18	3772	90	Bh	10−4, 12+1	8·9
18	3772	...	Sa	12−5, 14+1, 16+3	9·5
19	3773	32	Ca	12 (3) v (1) 13	9·3
24	3778	45	Bh	10−7, 16+5	9·3
24	3778	...	Sa	11−8, 12−5, 14+2, 16+3	9·5*b*
28	3782	...	,,	22−1, 20+1	10·3
28	3782	90	Bh	10−7, 20+3	9·7*b*
30	3784	32	Ca	=20	10·5
30	3784	60	D	k−2, 16+2	9·6
1924 Jan					
3	3788	34	Sa	22−3, =23, 20+3	10·3
3	3788	90	Bh	16−5, 20+1	10·4
5	3790	40	D	=22	10·1
6	3791	94	Ni	12 (7) v (1) 14	9·6
7	3792	90	Bh	=16	9·8
11	3796	,,	,,	=20, 29+4	10·5
11	3796	40	D	=22	10·1*b*
15	3800	,,	,,	22−3, 20+2	10·4
16	3801	94	Ni	=14	9·7
16	3801	90	Bh	=27	10·8
23	3808	40	D	20+1	10·4
23	3808	90	Bh	=28	11·0
25	3810	,,	,,	27−3, =28	11·0
25	3810	94	Ni	20 (2) v (1) 28	10·9
27	3812	80	Co	=28	11·0*b*
28	3813	,,	D	20−4, 28+1	10·9
29	3814	64	Sa	=31	11·3
31	3816	90	Bh	27−5	11·3
Feb					
1	3817	40	D	28−2, 31+1	11·2
4	3820	90	Bh	27−6, 28−3	11·3*b*
8	3824	60	D	28−4	11·4
11	3827	90	Bh	=31, =37	11·6*b*
13	3829	80	D	31−2, 37+3	11·5
14	3830	90	Bh	31−5, 43+2	11·7
14	3830	94	Ni	28 (3) v (1) 31	11·2
16	3832	64	Sa	=43	11·9*b*
22	3838	80	Ca	31 (3) v (1) 37	11·7
22	3838	90	Bh	=43, =44	11·9*b*
23	3839	80	D	37−1, 47+3	11·8
23	3839	94	Ni	31 (3) v (2) 43	11·7
26	3842	90	Bh	=43, =44	11·9*b*
28	3844	,,	,,	43 (1) v (1) 44	11·9
Mar					
1	3846	,,	Sa	43−2, 47+1	12·1
2	3847	60	D	37 (3) v (2) 47	11·9
4	3849	80	,,	37−2, 47+1	12·0
5	3850	94	Ni	31 (4) v (2) 43, 37 (1) v (2) 43	11·8
8	3853	40	D	=47	12·1*b*
9	3854	120	,,	37−3, 47+1	12·0
9	3854	,,	Bn	34 (4) v (1) 37	11·7
9	3854	90	Bh	=43	11·9
10	3855	,,	Sa	43−1, 47+1	12·0
11	3856	,,	Bh	43+1	11·8
11	3856	80	D	47−1	12·2
14	3859	,,	,,	37−2, 47+2	11·9

Jan. 11, D, 7c.
Jan. 16, Ni, About.
Mar. 8, About.

1924 Mar					
17	3862	94	Ni	31 (4) v (2) 43	11·7
19	3864	90	Bh	43−1	12·0
20	3865	,,	Sa	=31	11·3
22	3867	,,	Bh	43−1	12·0
23	3868	60	D	=47	12·1*b*
28	3873	80	Co	<43	<11·9
29	3874	90	Bh	43 (1) v (1) 47, 47+4	11·9
30	3875	94	Ni	31 (4) v (2) 43	11·7
30	3875	120	D	47+2	11·9*b*
Apr					
1	3877	,,	Bn	31 (2) v (1) 37	11·6
5	3881	80	D	37 (1) v (4) 47	11·8
6	3882	90	Bh	43−1	12·0
8	3884	,,	,,	31−6, =43	11·9
14	3890	,,	,,	31−3, 43+3	11·6
14	3890	,,	Sa	31−4, 43+2, =44	11·8
16	3892	,,	Bh	31−2	11·5
17	3893	94	Ni	31 (3) v (3) 43	11·6
30	3906	90	Bh	31−1	11·4
May					
4	3910	80	D	=31	11·3*b*
5	3911	94	Ni	31 (2) v (3) 43	11·5
5	3911	45	Bh	31−1	11·4*b*
7	3913	64	Sa	28−2, 31+1	11·2
7	3913	60	D	28−1, 31+4	11·0*b*
13	3919	94	Ni	31+1	11·2
22	3928	45	Bh	=31	11·3
23	3929	64	Sa	20−5, =28, 30+3	10·9
24	3930	94	Ni	14 (1) v (2) 20	9·9
27	3933	60	D	k−5, 22+2	9·9
28	3934	80	Co	=16	9·8*b*
June					
4	3941	90	Bh	16+1	9·7
8	3945	94	Ni	12 (8) v (2) 14	9·5
13	3950	90	Bh	10 (1) v (1) 16	9·2
20	3957	34	Sa	12−3, 22+8	9·3
21	3958	80	Co	12−2, 13+2	9·2
24	3961	90	Bh	10−4	9·0
26	3963	60	D	12−3, k+1	9·3
30	3967	90	Bh	=10, 12+3	8·6
30	3967	80	Co	=12	9·0*b*
July					
2	3969	94	Ni	9 (5) v (1) 12	8·9*b*
2	3969	90	Bh	10−1	8·7
4	3971	,,	,,	=10	8·6
5	3972	60	D	12−2, k+2	9·2*b*
8	3975	94	Ni	9 (4) v (1) 12	8·9
9	3976	60	D	10−3, 12+2	8·8
9	3976	80	Co	12−2	9·2
9	3976	90	Bh	5 (1) v (1) 10	8·2
11	3978	,,	,,	5 (1) v (2) 10	8·1
12	3979	60	D	10−1, 12+3	8·7
14	3981	90	Bh	=5	7·9
16	3983	80	Co	=12	9·0*b*
19	3986	90	Bh	=5	7·9
19	3986	30	Co	12−2, 13+3	9·2
20	3987	94	Ni	=9	8·4
24	3991	90	Bh	=5	7·9
29	3996	80	Co	10−1·5, 12+1	8·8
29	3996	90	Bh	=5	7·9
30	3997	94	Ni	5 (5) v (1) 9	8·3
31	3998	60	D	6−3, 10+2	8·4

Mar. 23, May 4, About.
Mar. 28, Invisible.
July 2, Ni, Difficult. Unsteady.
July 8, Difficult.
July 31, 7c.

(107) T CASSIOPEIÆ—*continued.*

1924					
Aug					
2	4000	80	Co	10−3·5, =12	9·0
3	4001	90	Bh	5+1	7·8
7	4005	,,	,,	5+1	7·8
13	4011	60	D	6−2, 10+3	8·3
15	4013	34	Sa	10−3, =12	8·9*b*
15	4013	150	Bh	5 (1) v (1) 6	8·0
17	4015	80	Co	10−3, =12	8·9
19	4017	90	Bh	5−1, 6+1	8·0
25	4023	45	,,	=5	7·9*b*
25	4023	34	Sa	10−2, 12+3	8·7
27	4025	60	D	=10	8·6
28	4026	90	Bh	5+1	7·8
30	4028	32	Ca	10 (2) v (2) 12	8·8
Sept					
1	4030	34	Sa	10−3, 12−3, 16+8	9·1
2	4031	90	Bh	5 (1) v (1) 6	8·0
5	4034	,,	,,	5 (1) v (1) 6	8·0
8	4037	80	Co	10−3, 12−1	9·0
8	4037	34	Sa	10−3, 12+1, 14+6	8·9
9	4038	90	Bh	4−3	8·0
11	4040	80	Co	10−3·5, 12−1	9·0
12	4041	94	Ni	9 (3) v (2) 12	8·8*b*
14	4043	80	Co	10−3, 12−1	9·0
16	4045	90	Bh	5−1	8·0
17	4046	34	Sa	10−2, 12+1	8·8
19	4048	60	D	10−1, 12+3	8·7*b*
24	4053	,,	Kw	=5	7·8*b*
24	4053	90	Bh	5−2	8·1
24	4053	34	Sa	10−8, 12−5, 22+7	9·4
26	4055	32	Ca	10 (1) v (3) 12	8·7
27	4056	34	Sa	10−6, 12−2, 16+6	9·2
27	4056	90	Bh	5−1	8·0
Oct					
2	4061	,,	,,	=5, =6	8·0
4	4063	34	Li	5 (2) v (8) 6	7·9
6	4065	64	Sa	5−3, =8, 10+2	8·3
11	4070	90	Bh	5+1	7·8
16	4075	32	Ca	9 (1) v (1) 10	8·5
22	4081	34	Li	2 (8) v (2) 5	7·7*b*
23	4082	,,	,,	3 (1) v (9) 4	7·5
23	4082	134	Sa	=5	7·9
23	4082	94	Ni	5 (3) v (1·5) 9	8·3
23	4082	90	Bh	5+1	7·8
26	4085	,,	,,	5+2	7·7
26	4085	34	Li	=3	7·5
31	4090	90	Bh	5−1	8·0
Nov					
2	4092	32	Ca	=3	7·5
3	4093	34	Sa	=5	7·9
4	4094	60	D	=5	7·9

Sept. 12, Difficult. Unsteady.
Sept. 24, Kw, T, Ruddy.
Oct. 23, Li, 6c. Ni, Difficult.
Oct. 26, Li, 7c.

1924					
Nov					
4	4094	90	Bh	=3, 5+5	7·4
4	4094	94	Ni	5+4	7·5
4	4094	34	Li	2 (5) v (5) 3	7·4
6	4096	,,	,,	2 (5) v (5) 3	7·4
7	4097	,,	,,	2 (3) v (7) 3	7·3
8	4098	90	Bh	2−2	7·4
9	4099	60	D	2−4, 5+2	7·7
10	4100	34	Li	2 (2) v (8) 3	7·3
10	4100	32	Ca	=2	7·2
12	4102	34	Li	2 (3) v (7) 3	7·3
14	4104	40	D	2−1, 5+4	7·4
15	4105	45	Bh	2−2, 5+5	7·4
16	4106	94	Ni	5+4	7·5
17	4107	60	D	2−4, 5+2	7·7
17	4107	34	Sa	=3	7·5
17	4107	,,	Li	2 (5) v (5) 3	7·4
19	4109	,,	,,	2 (3) v (7) 3	7·3
19	4109	45	Bh	2 (1) v (1) 3	7·4
22	4112	32	Ca	=2	7·2
24	4114	45	Bh	2 (1) v (1) 3	7·4
25	4115	94	Ni	5+4	7·5
27	4117	60	Kw	2 (1) v (1) 5, 6+5	7·6
28	4118	34	Sa	2−3, 4+2	7·5
29	4119	45	Bh	2−2, 5+5	7·4
30	4120	60	D	2−2, 5+4	7·5
30	4120	34	Li	2 (3) v (7) 3	7·3
Dec					
3	4123	,,	,,	1 (8) v (2) 2	7·2
6	4126	,,	,,	1 (8) v (2) 2	7·2
6	4126	45	Bh	2 (1) v (1) 3	7·4
9	4129	34	Li	2 (1) v (9) 3	7·3
9	4129	,,	Sa	2−3, 3+1	7·5
11	4131	32	Ca	2 (1) v (2) 3	7·3
13	4133	45	Bh	2 (1) v (1) 3	7·4
13	4133	34	Sa	2−4, =3, 4+1	7·6
13	4133	,,	Li	2 (2) v (8) 3	7·3
15	4135	,,	,,	2 (3) v (7) 3	7·3
19	4139	,,	Sa	=3	7·5
19	4139	90	Bh	2−2, 5+5	7·4
22	4142	,,	,,	5+3	7·6
22	4142	94	Ni	5+5	7·4
24	4144	40	D	=5	7·9
26	4146	90	Bh	5+1	7·8
28	4148	60	D	2−5, 5+1	7·8
30	4150	45	Bh	=3, 5+3	7·5
30	4150	94	Ni	5+3	7·6

Nov. 4, Ni, With 22, 7·8.
Nov. 15, Orange.
Nov. 16, Difficult, With 22, 7·8.
Nov. 25, Difficult. Unsteady. With 22, 7·8*b*
Nov. 27, Reddish.
Nov. 30, D, 7c.
Dec. 22, Ni, Difficult. With 22, 7·8.
Dec. 28, 7c.
Dec. 30, Ni, With 22, 7·9.

(294) W CASSIOPEIÆ. (V. 6.)

H.D. 004958.

Star B = B.D. + 57° 158, $7^m\cdot78$ (H.C.O. scale).
,, C = ,, + 58° 136, 8·12 (,, ,,).
,, D = ,, + 58° 132, 8·49 (,, ,,).
,, F = ,, + 57° 149 8·8 (B.D. value).
,, G = ,, + 57° 156, 7·98 (H.C.O. scale).
,, H = ,, + 57° 159, 8·8 (B.D. value).

The magnitudes of stars B, C, and D were obtained from estimates in grades on three nights in 1925 by the Director, and were connected with the Harvard system by means of 14 stars of $6^m\cdot4-9^m\cdot4$ from **H.A. 45, 57,** and **74,** the mean deviation from the curve being $0^m\cdot12$.

Date.	Julian Date.	Inst.	Observer.	Comparisons.	Deduced Mag.	Date.	Julian Date.	Inst.	Observer.	Comparisons.	Deduced Mag.
917						1917					
an						Oct					
4	1233	90	Bh	k−5, l+1	12·0	10	1512	90	Bh	a+2	9·2
14	1243	150	,,	=l	12·1	20	1522	,,	,,	a+1	9·3
18	1247	,,	,,	=l	12·1	Nov					
23	1252	90	,,	l+1	12·0*b*	4	1537	,,	,,	a+1	9·3
26	1255	,,	,,	l−2	12·3	10	1543	,,	,,	a−1, d+4	9·5
eb						14	1547	,,	,,	a−4, =d	9·9
6	1266	,,	,,	l−1	12·2	23	1556	,,	,,	e−1, f+3	10·2
16	1276	,,	,,	k−4, l+2	11·9*b*	25	1558	,,	,,	e (1) v (1) f	10·3
24	1284	,,	,,	g (1) v (1) l, =k	11·5*b*	Dec					
lar						1	1564	45	,,	d−3, e−1	10·2*b*
12	1300	,,	,,	=g, =h	11·1	2	1565	,,	,,	d−1, e+1	10·0
15	1303	,,	,,	=g, =h	11·1	8	1571	90	,,	d−5, e−3, f+1	10·4
21	1309	,,	,,	=g, h+2, k+5	11·0	14	1577	,,	,,	f−2, g+3	10·7
pr						21	1584	45	,,	f−3, g+2, h+4	10·8
3	1322	,,	,,	e (1) v (1) l,	11·1*b*	28	1591	150	,,	f−5, =g, h+2	11·0
				=g, =h		31	1594	90	,,	=g, h+2	11·0
15	1334	,,	,,	f−2, g+3	10·7	1918					
24	1343	,,	,,	e−2, f+2	10·3	Jan					
lay						3	1597	,,	,,	f−5, =g, h+2	11·0
1	1350	,,	,,	d−2, =e, f+4	10·1	7	1601	,,	,,	g−1, h+1	11·1
11	1360	,,	,,	d+1, e+3	9·8*b*	12	1606	150	,,	h+1, k+4	11·1
24	1373	,,	,,	a−1, d+4	9·5	18	1612	90	,,	g−3, k+2	11·3
une						21	1615	150	,,	g−5, =k, l+6	11·5
4	1384	,,	,,	a−2	9·6	28	1622	,,	,,	k−2, l+4	11·7
15	1395	,,	,,	a−1	9·5	Feb					
20	1400	,,	,,	a−1, d+4	9·5*b*	4	1629	90	,,	k−3	11·8
26	1406	,,	,,	a−2, d+3	9·6*b*	9	1634	,,	,,	k−4, l+2	11·9
uly						13	1638	,,	,,	k−4, l+2	11·9
3	1413	,,	,,	a (1) v (1) d	9·7	18	1643	,,	,,	k−5, l+1	12·0*b*
11	1421	,,	,,	=a	9·4	24	1649	,,	,,	k−4, l+2	11·9
22	1432	,,	,,	a+2	9·2	Mar					
ug						1	1654	,,	,,	l+1	12·0*b*
2	1443	,,	,,	a+4	9·0	7	1660	,,	,,	=l	12·1
9	1450	,,	,,	a+5	8·9	9	1662	,,	,,	=l	12·1
14	1455	45	,,	a+8	8·6*b*	13	1666	,,	,,	l+2	11·9
21	1462	90	,,	a+9	8·5*b*	20	1673	,,	,,	l+1	12·0
5	1466	,,	,,	a+10	8·4*b*	22	1675	,,	,,	k−4, l+2	11·9
pt						29	1682	,,	,,	l+2	11·9
1	1473	45	,,	a+10	8·4*b*	Apr					
5	1477	,,	,,	a+8	8·6*b*	2	1686	,,	,,	l+1	12·0
1	1483	90	,,	a+6	8·8	8	1692	45	,,	k−5, l+1	12·0
0	1492	,,	,,	a+6	8·8*b*	17	1701	90	,,	k−4, l+2	11·9
0	1502	,,	,,	a+4	9·0	18	1702	,,	,,	k−4, l+3	11·8*b*
ct						21	1705	,,	,,	k−3, l+3	11·8*b*
4	1506	,,	,,	a+2	9·2	22	1706	,,	,,	g−5, =k, l+5	11·5*b*

(294) W CASSIOPEIÆ—*continued.*

1918					
Apr					
26	1710	90	Bh	h−1, k+2	11·3
May					
4	1718	,,	,,	f−3, =g	10·9
6	1720	,,	,,	f−3, g+2	10·8
7	1721	,,	,,	f−1, g+2	10·7
8	1722	,,	,,	e−2, f+2	10·3*b*
10	1724	45	,,	e−3, f+1	10·4
18	1732	90	,,	e−1, f+3	10·2
26	1740	,,	,,	e−1, f+2	10·3
29	1743	,,	,,	d−3, f+3	10·2
31	1745	,,	,,	d−1, e+1, f+5	10·0
June					
2	1747	45	,,	d−1, f+5	10·0
3	1748	160	Br	a−2, d+3	9·6*b*
11	1756	45	Bh	a−3 e+4	9·7
14	1759	90	,,	a−2	9·6
22	1767	,,	,,	a−2	9·6*b*
26	1771	45	,,	=a	9·4
29	1774	90	,,	a+2	9·2
July					
8	1783	,,	,,	a+2	9·2
10	1785	,,	,,	a+3	9·1
18	1793	45	,,	a+5	8·9
25	1800	,,	,,	a+3	9·1
31	1806	,,	,,	a+2	9·2
Aug					
7	1813	,,	,,	a+3	9·1
9	1815	90	,,	a+3	9·1
13	1819	,,	,,	a+2	9·2
16	1822	,,	,,	a+3	9·1
21	1827	45	,,	a+6	8·8
24	1830	,,	,,	a+4	9·0
30	1836	,,	,,	a+4	9·0
Sept					
8	1845	90	,,	a+8	8·6
11	1848	,,	,,	a+8	8·6
17	1854	45	,,	a+10	8·4
22	1859	90	,,	a+8	8·6
28	1865	,,	,,	a+8	8·6
Oct					
4	1871	,,	,,	a+6	8·8
8	1875	,,	,,	a+6	8·8
13	1880	,,	,,	a+4	9·0
23	1890	,,	,,	a+5	8·9
31	1898	,,	,,	a+6	8·8
Nov					
2	1900	,,	,,	a+6	8·8
11	1909	45	,,	a+5	8·9
16	1914	,,	,,	a+3	9·1
21	1919	90	,,	a+3	9·1
Dec					
5	1933	150	,,	a+1	9·3
6	1934	90	,,	=a	9·4
10	1938	150	,,	a+1	9·3
13	1941	90	,,	=a	9·4*b*
14	1942	150	,,	a+1	9·3*b*
18	1946	90	,,	=a	9·4
23	1951	,,	,,	=a	9·4
25	1953	,,	,,	a−1	9·5
29	1957	,,	,,	a−1	9·5
31	1959	150	,,	a−1	9·5
1919					
Jan					
2	1961	90	,,	a−2	9·6

Dec. 6, 10, 13, 14, 31, Yellow.
Dec. 18, 23, 25, Orange.

1919					
Jan					
6	1965	90	Bh	a−4, d+2	
11	1970	,,	,,	a−4	
18	1977	,,	,,	a−3, d+3	
22	1981	,,	,,	a−6, =d	1
26	1985	,,	,,	a−5, d+1	
Feb					
1	1991	,,	,,	d−1	1
7	1997	,,	,,	d−2, f+2	1
8	1998	,,	,,	d−3, f+2	1
12	2002	,,	,,	d−4, f+1	1
18	2008	,,	,,	=f	1
23	2013	,,	,,	f−1, g+5	1
28	2018	,,	,,	=f	1
Mar					
9	2027	,,	,,	f−2	1
16	2034	,,	,,	f−2, g+3	1
22	2040	,,	,,	f−3	1
24	2042	,,	,,	g−1, h+1	1
28	2046	,,	,,	g−1, h+1	1
Apr					
1	2050	,,	,,	=h	1
20	2069	,,	,,	h−2	1
May					
7	2086	,,	,,	h−4, l+5	1
12	2091	,,	,,	g−8, l+3	1
16	2095	150	,,	h−7, l+2	1
17	2096	90	Wh	=h	1
20	2099	150	Bh	h−4, l+5	1
20	2099	120	D	h (2) v (1) l, h−5	1
22	2101	90	Wh	=k	1
28	2107	60	D	h−1, k+2	1
30	2109	90	Bh	g−4, l+6	1
June					
2	2112	,,	,,	g−5, l+6	1
6	2116	45	,,	g−3, k+2	1
7	2117	60	D	g−2, h+1	1
13	2123	45	Bh	f−5, k+5	1
21	2131	,,	,,	d−4, f+1	1
21	2131	90	Wh	f−2	1
28	2138	,,	Bh	a−6, f+5	1
July					
3	2143	60	D	e−3, f+1	1
5	2145	90	Bh	a−3	
7	2147	45	,,	a−2	
15	2155	,,	,,	a+1, d+7	
20	2160	90	,,	a+2	
24	2164	,,	,,	a+3	
25	2165	45	,,	a+5	
29	2169	,,	,,	a+5	
Aug					
6	2177	90	,,	a+6	
7	2178	60	D	a+1	
11	2182	90	Bh	a+6	
14	2185	60	D	a+2	
19	2190	,,	,,	a+2	
19	2190	90	Bh	a+7	
24	2195	,,	,,	a+6	
26	2197	60	D	=a	
27	2198	90	Wh	=d	
30	2201	,,	Bh	a+7	
Sept					
5	2207	60	D	=a	

May 20, D, Difficult.
Aug. 7, Sept. 5, Yellow.
Aug. 14, 19, D, Orange.
Aug. 26, Pale orange.

(294) W CASSIOPEIÆ—*continued.*

1919 Sept					
7	2209	90	Bh	a+7	8·7
11	2213	,,	,,	a+7	8·7
15	2217	,,	,,	a+6	8·8
15	2217	,,	Wh	=a	9·4
18	2220	60	D	a−1, d+4	9·5
23	2225	90	Bh	a+6	8·8
27	2229	45	,,	a+5	8·9
30	2232	90	,,	a+5	8·9
Oct					
3	2235	,,	,,	a+6	8·8
9	2241	,,	,,	a+6	8·8
15	2247	,,	,,	a+6	8·8
15	2247	45	Br	a+8	8·6
19	2251	...	Wh	a+4	9·0
20	2252	60	D	a+6	8·8*b*
21	2253	90	Bh	a+6	8·8
25	2257	,,	,,	a+5	8·9
31	2263	,,	,,	a+4	9·0*b*
Nov					
1	2264	,,	,,	a+6	8·8
8	2271	,,	,,	a+6	8·8
10	2273	,,	,,	a+5	8·9
19	2282	,,	,,	a+6	8·8
21	2284	,,	,,	a+5	8·9
24	2287	,,	,,	a+5	8·9
25	2288	60	D	a+3	9·1*b*
28	2291	90	Bh	a+6	8·8
Dec					
1	2294	,,	,,	a+6	8·8
5	2298	45	,,	a+6	8·8
11	2304	90	,,	a+6	8·8
16	2309	,,	,,	a+7	8·7
21	2314	,,	,,	a+8	8·6
24	2317	,,	,,	a+10	8·4
27	2320	,,	,,	a+7	8·7
1920 Jan					
1	2325	45	Br	a+3	9·1
1	2325	90	Bh	a+4	9·0
13	2337	,,	,,	a+3	9·1
14	2338	60	D	a+3	9·1
21	2345	90	Bh	a+2	9·2
23	2347	,,	,,	a+2	9·2
24	2348	,,	Wh	=a	9·4
31	2355	,,	Bh	=a	9·4
Feb					
4	2359	,,	,,	a+1	9·3
11	2366	45	,,	a+1	9·3
18	2373	90	,,	=a	9·4
23	2378	,,	,,	a−2	9·6
26	2381	,,	Wh	=a	9·4
28	2383	,,	Bh	a−3, e+4	9·7
Mar					
2	2386	,,	,,	a−4, e+3	9·8
7	2391	,,	,,	a−5	9·9
11	2395	,,	,,	a−5	9·9
12	2396	,,	Wh	=e	10·1
19	2403	60	D	g+1	10·9
20	2404	120	Bn	e (4) v (1) f	10·4
21	2405	90	Bh	=e	10·1
23	2407	,,	,,	e−2	10·3
31	2415	,,	,,	a−10, e−3	10·4*b*

Oct. 15, Br, Rather orange.
Oct. 19, 8½-in. mirror.
Oct. 20, Yellow.
Nov. 25, D, Pale orange.

1920 Apr					
9	2424	90	Bh	e−5	10·6*b*
12	2427	,,	,,	f−2, g+3	10·7
16	2431	120	Bn	g (1) v (2) h	11·0
17	2432	45	Bh	=g	11·0*b*
21	2436	90	Wh	=k	11·5
27	2442	,,	Bh	g−1, h+1	11·1
May					
9	2454	,,	,,	g−3	11·3
14	2459	120	D	h−5	11·7*b*
14	2459	90	Bh	h−2, k+1	11·4
19	2464	120	Bn	k (3) v (2) l	11·8
23	2468	,,	,,	k (2) v (1) l	11·9
24	2469	90	Bh	l+2	11·9
June					
2	2478	,,	,,	l+1	12·0
4	2480	,,	,,	l+1	12·0
8	2484	120	Bn	k (2) v (1) l	11·9
8	2484	150	Bh	l+2	11·9
15	2491	90	,,	l+3	11·8
18	2494	,,	,,	l+3	11·8
23	2499	,,	,,	g−7, l+4	11·7
July					
7	2513	45	,,	=h	11·2*b*
10	2516	90	,,	f−5, h+2	11·0
19	2525	120	D	g−1, h+2	11·0
19	2525	90	Bh	f−3, h+3	10·8
24	2530	,,	,,	f−3	10·8
27	2533	,,	,,	f−1	10·6
30	2536	,,	,,	e−2, f+2	10·3*b*
Aug					
6	2543	,,	,,	a−4, d+1	9·8
13	2550	,,	,,	a+1	9·3
18	2555	45	,,	a+4	9·0*b*
29	2566	,,	,,	a+3	9·1
Sept					
6	2574	90	,,	a+4	9·0*b*
8	2576	60	D	a−3, d+2	9·7
10	2578	90	Bh	a+6	8·8
11	2579	48	Wi	a+1	9·3
12	2580	,,	,,	a+2	9·2
12	2580	75	Bn	a−1, =b	9·5
12	2580	117	Gi	a+4	9·0
12	2580	90	Bh	a+6	8·8
16	2584	,,	,,	a+6	8·8
16	2584	48	Wi	a−1	9·5
18	2586	50	Bn	a+1	9·3
18	2586	48	Wi	=a	9·4
19	2587	,,	,,	a+2	9·2
19	2587	90	Wh	a+2	9·2
22	2590	,,	Bh	a+6	8·8
25	2593	,,	,,	a+6	8·8
28	2596	,,	,,	a+6	8·8*b*
28	2596	75	Gi	a+4	9·0
Oct					
2	2600	48	Wi	a−3, d+1	9·8
2	2600	90	Bh	a+6	8·8
6	2604	,,	,,	a+6	8·8
10	2608	50	Bn	a+1	9·3
11	2609	60	D	a−2, d+3	9·6
12	2610	90	Bh	a+8	8·6
13	2611	48	Wi	=a	9·4*b*
14	2612	,,	,,	a+1	9·3*b*
15	2613	75	Gi	a+6	8·8
18	2616	90	Bh	a+8	8·6

April 16, t.
May 14, D, Difficult.

(294) W CASSIOPEIÆ—*continued.*

1920					
Oct					
23	2621	120	Bn	a+1·5	9·3
25	2623	90	Bh	a+8	8·6
29	2627	,,	,,	a+7	8·7
Nov					
1	2630	,,	,,	a+8	8·6
1	2630	48	Wi	a−3, e+4	9·7
2	2631	50	Bn	a+1·5	9·3
10	2639	150	Bh	a+6	8·8
10	2639	117	Gi	a+6	8·8
11	2640	48	Wi	a+2	9·2*b*
15	2644	90	Bh	a+8	8·6
18	2647	,,	,,	a+8	8·6
30	2659	45	,,	a+7	8·7
Dec					
2	2661	117	Gi	F+2	8·6*b*
10	2669	90	Bh	a+8	8·6
17	2676	,,	,,	a+8	8·6
21	2680	,,	,,	a+10	8·4
26	2685	,,	,,	a+8	8·6
28	2687	,,	,,	a+10	8·4
28	2687	48	Wi	a+4	9·0*b*
31	2690	90	Bh	a+10	8·4
1921					
Jan					
2	2692	,,	,,	a+2	9·2*b*
7	2697	48	Wi	=a	9·4
9	2699	,,	,,	a+2	9·2
9	2699	117	Gi	a+10	8·4*b*
12	2702	48	Wi	a+4	9·0
13	2703	45	Bh	a+6	8·8
14	2704	48	Wi	a−2, e+5	9·6
16	2706	60	D	a+5	8·9*b*
21	2711	45	Bh	a+8	8·6
27	2717	47	Gi	G−2, H+2	8·4*b*
30	2720	90	Bh	a+6	8·8
31	2721	48	Wi	a−2, d+3	9·6
Feb					
1	2722	,,	,,	=a	9·4
2	2723	,,	,,	a−1, d+4	9·5
2	2723	90	Bh	a+8	8·6
3	2724	48	Wi	=a	9·4
9	2730	90	Bh	a+10	8·4
15	2736	75	Gi	G−1, H+2	8·3
17	2738	90	Bh	a+8	8·6
20	2741	,,	,,	a+6	8·8
22	2743	48	Wi	a−2, d+3	9·6
25	2746	90	Bh	a+6	8·8
Mar					
1	2750	47	Gi	G−3, H+1	8·5*b*
2	2751	50	Bn	a+2	9·2
2	2751	48	Wi	a−3, d+2	9·7
2	2751	90	Bh	a+6	8·8
6	2755	,,	,,	a+6	8·8
10	2759	,,	,,	a+4	9·0
10	2759	48	Wi	=a	9·4
16	2765	90	Bh	a+2	9·2
17	2766	47	Gi	=H	8·8*b*
21	2770	45	Bh	=a	9·4
24	2773	90	,,	a+1	9·3
24	2773	70	Bn	b (2) v (1) d	9·8
24	2773	48	Wi	e−2, f+2	10·3
25	2774	,,	,,	a−6, d−1	10·0
30	2779	,,	,,	a−b, e+1	10·0

Dec. 21, 31, Orange.
Dec. 28, Bh, Orange.
Jan. 16, Uncertain of course.

1921					
Mar					
31	2780	70	Bn	d (2) v (1) e	10·
Apr					
1	2781	90	Bh	=a	9·
3	2783	75	Gi	=a	9·
4	2784	,,	Bn	e (1) v (1) f	10·
7	2787	48	Wi	e−3	10·
8	2788	,,	,,	d−1, e+1	10·
9	2789	90	Bh	a−4, e+3	9·
12	2792	,,	,,	a−8, e−1	10·
12	2792	48	Wi	e−2, f+2	10·
23	2803	90	Bh	e−3, f+1	10·
28	2808	,,	,,	e−4, =f	10·
28	2808	120	Bn	=f	10·
May					
7	2817	90	Bh	e−5, f−1	10·
8	2818	48	Wi	f−4, g+1	10·
9	2819	,,	,,	f−3, g+2	10·
15	2825	90	Bh	f−2, h+5	10·
22	2832	120	Bn	g (2) v (1) h	11·
23	2833	90	Bh	f−3, h+4	10·
24	2834	,,	,,	f−4, h+3	10·
28	2838	48	Wi	g−1, h+1	11·
31	2841	60	D	h−2	11·
June					
2	2843	90	Bh	=g, h+2	11·
6	2847	48	Wi	h−3	11·
7	2848	120	Bn	g (2) v (1) h	11·
7	2848	117	Gi	=f, g+2·5	10·
10	2851	90	Bh	=h	11·
21	2862	117	Gi	f−3, g+1·5	10·
24	2865	90	Bh	h−2	11·
27	2868	,,	,,	h−2, l+7	11·
29	2870	120	Bn	k (2) v (1) l	11·
29	2870	60	D	h−3	11·
July					
1	2872	117	Gi	g−3, h+1·5	11·
4	2875	90	Bh	h−5, l+4	11·
8	2879	120	Bn	k (3) v (2) l	11·
9	2880	60	D	<h	<11·
9	2880	48	Wi	=l	12·
11	2882	90	Bh	h−5	11·
15	2886	117	Gi	g−2, h+1	11·
23	2894	48	Wi	<l	<12·
26	2897	60	D	<g	<11·
26	2897	90	Bh	l+1	12·
29	2900	,,	,,	l+1	12·
30	2901	117	Gi	g−2·5, h+1	11·
31	2902	120	D	<k	<11·
Aug					
3	2905	60	,,	<h	<11·
7	2909	90	Bh	l+1	12·
9	2911	85	Bn	k (1) v (1) l	11·
11	2913	117	Gi	=h	11·
14	2916	90	Bh	k−4, l+2	11·
19	2921	,,	,,	k−5, l+3	11·
25	2927	,,	,,	k−2, l+4	11·
26	2928	60	D	<h	<11·
30	2932	90	Bh	k−3, l+3	11·
Sept					
1	2934	60	D	k−2, l+5	11·
4	2937	90	Bh	k−3, l+3	11·
5	2938	120	Bn	g (2) v (1) h	11·

June 29, D, Difficult.
July 9, Wi, Roughly.
July 23, Glimpsed.
July 31, Difficult.
Sept. 5, Bn, t. Wi, Not seen.

(294) W CASSIOPEIÆ—*continued.*

1921					
Sept					
5	2938	48	Wi	<k	<11·5*b*
6	2939	90	Bh	k−4, l+2	11·9
7	2940	60	D	g−1, h+2	11·0
7	2940	48	Wi	=h	11·2*b*
8	2941	,,	,,	g−1, h+1	11·1
10	2943	,,	,,	g−2, =h	11·2
10	2943	90	Bh	k−1	11·6
14	2947	60	D	f−4, g+1	10·9*b*
15	2948	120	Bn	=g	11·0
16	2949	90	Bh	f−5, k+5	11·0
22	2955	120	Bn	f (1) v (1) g	10·7
22	2955	48	Wi	d−1, e+1	10·0
24	2957	60	D	e−3, f+1	10·4
24	2957	90	Bh	e−2, f+2	10·3
25	2958	,,	,,	e+1	10·0
28	2961	60	D	e−3, f+1	10·4
29	2962	120	Bn	e (3) v (1) f	10·4
30	2963	90	Bh	a−5, e+2	9·9
Oct					
1	2964	60	D	e−3, f+1	10·4
2	2965	117	Gi	a−1, d+4	9·5
2	2965	48	Wi	a−3, d+2	9·7
4	2967	,,	,,	a−2, d+3	9·6
5	2968	,,	,,	a−1, d+4	9·5
5	2968	60	D	e−2, f+3	10·3
6	2969	48	Wi	a−2, d+3	9·6
6	2969	120	Bn	e (2) v (1) f	10·4
6	2969	90	Bh	a−4, d+3	9·7
9	2972	,,	,,	a−2	9·6
9	2972	48	Wi	=a	9·4
9	2972	60	D	e−0·5	10·2
24	2987	90	Bh	a+3	9·1
30	2993	47	Gi	H−2, a+3·5	9·0*b*
31	2994	45	Bh	a+5	8·9
Nov					
1	2995	120	Bn	=a	9·4*b*
6	3000	,,	,,	a+1	9·3
6	3000	90	Bh	a+6	8·8
17	3011	45	,,	a+5	8·9
23	3017	90	,,	a+6	8·8
24	3018	60	D	a−1, d+4	9·5
26	3020	50	Bn	a+2	9·2
29	3023	47	Gi	H−1, a+4	9·0*b*
29	3023	90	Bh	a+6	8·8
Dec					
3	3027	,,	,,	a+4	9·0
13	3037	,,	,,	a+5	8·9
20	3044	48	Wi	d+1	9·8
21	3045	90	Bh	a+4	9·0
25	3049	,,	,,	a+4	9·0
25	3049	75	Bn	=a	9·4
27	3051	,,	Gi	G−2, a+5	8·6
29	3053	90	Bh	a+4	9·0
31	3055	75	Bn	a+1	9·3
1922					
Jan					
3	3058	90	Bh	a+6	8·8
8	3063	,,	,,	a+8	8·6
10	3065	,,	,,	a+8	8·6
10	3065	48	Wi	a+6	8·8
18	3073	90	Bh	a+8	8·6
19	3074	75	Gi	B (2) v (3·5) G	7·9*b*
20	3075	48	Wi	a+5	8·9
21	3076	90	Bh	a+10	8·4
29	3084	,,	,,	a+8	8·6
31	3086	48	Wi	a+7	8·7
Feb					
2	3088	90	Bh	a+10	8·4
5	3091	,,	,,	a+12	8·2
9	3095	25	Bn	a+12	8·2*b*
10	3096	90	Bh	a+10	8·4
12	3098	60	D	a+10	8·4*b*
13	3099	50	Bn	a+12	8·2*b*
14	3100	75	Gi	B+1	7·7*b*
17	3103	45	Bh	a+14	8·0
18	3104	50	Bn	a+10	8·4*b*
18	3104	48	Wi	a+11	8·3
20	3106	90	Bh	a+14	8·0
24	3110	50	Bn	a+8	8·6*b*
26	3112	48	Wi	a+6	8·8
26	3112	90	Bh	a+10	8·4
Mar					
4	3118	,,	,,	a+14	8·0
4	3118	50	Bn	a+7	8·7*b*
4	3118	75	Gi	B (2·5) v (2·5) G	7·9
4	3118	48	Wi	a+6	8·8
7	3121	,,	,,	a+6	8·8
9	3123	50	Bn	a+10	8·4*b*
10	3124	90	Bh	a+12	8·2
16	3130	,,	,,	a+10	8·4
19	3133	,,	,,	a+10	8·4
21	3135	50	Bn	a+5	8·9*b*
28	3142	90	Bh	a+10	8·4
31	3145	,,	,,	a+7	8·7
Apr					
1	3146	50	Bn	a+4	9·0*b*
4	3149	90	Bh	a+6	8·8
9	3154	,,	,,	a+6	8·8
15	3160	75	Gi	G (4) v (2) H	8·5
17	3162	90	Bh	a+5	8·9
18	3163	150	,,	a+4	9·0
19	3164	75	Bn	=b	9·5
19	3164	48	Wi	a−2	9·6*b*
20	3165	33	,,	a+2	9·2
23	3168	90	Bh	a+4	9·0
24	3169	33	Wi	a−1	9·5
May					
2	3177	90	Bh	a+2	9·2
4	3179	50	Bn	a (2) v (1) d	9·7
4	3179	33	Wi	a−4	9·8*b*
6	3181	120	,,	a−2, d+3	9·6
8	3183	90	Bh	=a	9·4
13	3188	120	Wi	a−6, e−2	10·1
17	3192	,,	,,	e+1	10·0
19	3194	50	Bn	d+1	9·8
21	3196	90	Bh	a−2	9·6
22	3197	62	D	=f	10·5*b*
22	3197	117	Gi	a (2·5) v (1·5) e	9·9
27	3202	90	Bh	a−3, e+4	9·7
June					
4	3210	45	,,	a−4, e+3	9·8
4	3210	50	Bn	f (1) v (2) g	10·7
12	3218	45	Bh	=e	10·1
19	3225	90	,,	=f	10·5

Sept. 7, Wi, Difficult.
Sept. 15, t.
Jan. 19, 6c.

Feb. 14 5c.
Mar. 4, Gi, 5c.
April 15, 6c.
May 22, D, About. Gi, 6c.

(294) W CASSIOPEIÆ—*continued.*

1922					
June					
21	3227	117	Gi	e (3·5) v (3·5) f	10·3
29	3235	90	Bh	f−3, h+4	10·8
July					
5	3241	117	Gi	e (5) v (2) f, g+3·5	10·5
10	3246	90	Bh	h+2	11·0
14	3250	,,	,,	=h	11·2*b*
20	3256	,,	,,	=h	11·2
20	3256	117	Gi	f (1·5) v (2) g	10·7
27	3263	90	Bh	h−5, l+4	11·7
30	3266	120	Bn	h (2) v (1) l	11·8
Aug					
5	3272	90	Bh	l+2	11·9
11	3278	,,	,,	l+2	11·9
11	3278	117	Gi	k (1·5) v (4·5) l	11·6
17	3284	90	Bh	l+1	12·0
24	3291	117	Gi	h (3) v (2) k	11·4
25	3292	90	Bh	l−1	12·2
25	3292	120	Bn	l−1	12·2
26	3293	44	Wi	l−5	12·6
31	3298	90	Bh	l−1	12·2
Sept					
4	3302	,,	,,	l−1	12·2
9	3307	,,	,,	=l	12·1
11	3309	120	Wi	l−1	12·2
13	3311	,,	,,	l−1	12·2
18	3316	45	Bh	l−1	12·2*b*
19	3317	117	Gi	k (3) v (2·5) l	11·8
20	3318	120	Bn	l−1	12·2
21	3319	150	Bh	=l	12·1
26	3324	90	,,	l−1	12·2
Oct					
6	3334	,,	,,	l+1	12·0
12	3340	117	Gi	g (1·5) v (1) h	11·1*b*
13	3341	120	Bn	k (4) v (1) l	12·0
13	3341	,,	Wi	l+1	12·0
14	3342	90	Bh	=l	12·1
20	3348	,,	,,	l+1	12·0
24	3352	120	Bn	k (3) v (2) l	11·8
25	3353	90	Bh	l+1	12·0
Nov					
1	3360	,,	,,	l+2	11·9
5	3364	117	Gi	f (1·5) v (4) g	10·6*b*
11	3370	100	Lp	=k	11·5*b*
11	3370	90	Bh	h−5, l+4	11·7
17	3376	,,	,,	=k	11·5
18	3377	120	Bn	g (1) v (1) h	11·1
19	3378	90	Bh	h−2, k+1	11·4
24	3383	117	Gi	e (1·5) v (2·5) f	10·3
24	3383	45	Bh	h+2	11·0
24	3383	100	Lp	=g	11·0
26	3385	120	Bn	g (1) v (1) h	11·1*b*
28	3387	90	Bh	f−4, h+3	10·9
Dec					
5	3394	,,	,,	h+5	10·7
6	3395	100	Lp	g+1	10·9*b*
8	3397	120	Bn	f (3) v (2) g	10·8
11	3400	90	Bh	=f	10·5
12	3401	117	Gi	e (1) v (4) f	10·2

June 21, 7c.
July 5, 20, Gi, 6c.
Aug. 24, 5c. Aug. 25, Bn, t.
Sept. 19, 7c.
Oct. 12, 6c.
Nov. 5, 5c.
Nov. 24, Gi, 7c.
Dec. 12, 6c.

1922					
Dec					
17	3406	90	Bh	f+4	10·
18	3407	,,	,,	d+1, f+6	9
19	3408	44	Wi	e−4, =f	10·
20	3409	,,	,,	e−2, g+6	10·
20	3409	62	D	g−1	11·
20	3409	100	Lp	f (2) v (2) g	10·
23	3412	,,	,,	f−1	10·
26	3415	,,	,,	=f	10·
26	3415	75	Bn	e−3, f+1	10·
26	3415	44	Wi	e−2, f+3	10·
28	3417	90	Bh	=d	9
1923					
Jan					
2	3422	100	Lp	=f	10·
4	3424	90	Bh	d+1	9
6	3426	120	Wi	=e, f+5	10·
8	3428	,,	,,	e−1	10·
8	3428	75	Bn	d (3) v (1) e	10·
8	3428	94	Li	=e	10·
11	3431	90	Bh	=e	10·
12	3432	100	Lp	f+1	10·
14	3434	90	Bh	a−5, e+2	9
16	3436	100	Lp	f+1	10·
17	3437	117	Gi	a (3·5) v (2·5) e	9
20	3440	94	Li	=a	9
20	3440	90	Bh	a−3, e+4	9
23	3443	100	Lp	e (1) v (2) f	10·
24	3444	120	Bn	a−4, d+1	9
27	3447	90	Bh	a−2	9
Feb					
3	3454	45	,,	a+1	9
4	3455	100	Lp	=e	10·
5	3456	50	Bn	d (1) v (3) e	9
8	3459	90	Bh	a+2	9
16	3467	45	,,	a+4	9
21	3472	100	Lp	=d	9
23	3474	90	Bh	a+5	8
25	3476	,,	,,	a+5, d+10	8
Mar					
4	3483	50	Bn	a+2	9
4	3483	100	Lp	=a	9
5	3484	90	Bh	a+6	8
5	3484	...	Sa	a+2, d+4, e+8, f+10	9
13	3492	90	Bh	a+8	8
17	3496	,,	,,	a+10	8
17	3496	50	Bn	a+4	9
17	3496	...	Sa	a+5	8
18	3497	34	Li	C (3) v (7) D	8
19	3498	75	Gi	B (2·5) v (1·5) G	7
21	3500	45	Bh	a+12	8
24	3503	...	Sa	a+11, f+22	8
25	3504	34	Li	C (2) v (8) D	8
25	3504	90	Bh	a+10	8
Apr					
8	3518	,,	,,	a+12	8
8	3518	100	Lp	v (2) a (1) e	8
8	3518	34	Li	C (1) v (9) D	8
9	3519	75	Bn	a+3	9
13	3523	90	Bh	a+8	8
13	3523	100	Lp	v (2) v (2) f	8

Jan. 8, Wi, Difficult. Li, Orange.
Jan. 16, Very white.
Jan. 17, 5c.
Apr. 8, Li, Light orange.
Apr. 13, Bh, Orange.

(294) W CASSIOPEIÆ—*continued.*

3524	75	Bn	a+2	9·2	1923 Aug 15	3647	100	Lp	f (2) v (1) g	10·8
3527	34	Li	C (1) v (9) D	8·2	22	3654	120	D	=h	11·2*b*
2529	...	Sa	a+6	8·8	22	3654	90	Bh	a−6, g+10	10·0
3532	90	Bh	a+6	8·8	28	3660	...	Sa	=h	11·2
3536	75	Bn	a+1·5	9·3	30	3662	120	Bn	=h	11·2
3539	90	Bh	a+8	8·6	30	3662	150	Lp	=g	11·0*b*
					31	3663	90	Bh	g+2	10·8
3541	...	Sa	a+5	8·9	Sept 2	3665	,,	,,	g−1	11·1
3543	34	Li	C (3) v (7) D	8·2	2	3665	120	D	h−0·5	11·2
3545	100	Lp	v (2) a (2) f	8·3*b*	4	3667	100	Lp	=g	11·0*b*
3547	45	Bh	a+5	8·9*b*	7	3670	90	Bh	g−2, h−1	11·2
3552	...	Sa	a+7, b+5	8·9	8	3671	120	Bn	g (4) v (1) h	11·1
3554	60	D	a+4	9·0	9	3672	150	Lp	=g	11·0*b*
3556	34	Li	C (8) v (2) D	8·4	11	3674	120	D	k−1, l+5	11·6*b*
3556	100	Lp	v (2) a (2) f	8·3*b*	13	3676	90	Bh	g−3	11·3
3557	50	Bn	a+1	9·3	15	3678	...	Sa	g−1, h+1	11·1
3559	75	Gi	=H	8·8	15	3678	100	Lp	g (1) v (2) h	11·0*b*
3563	34	Li	C (8) v (2) D	8·4	18	3681	150	,,	g (2) v (1) h	11·1*b*
3565	100	Lp	v (2) a (2) d	9·0*b*	18	3681	120	D	k−1, l+5	11·6
3565	60	D	a+3	9·1	22	3685	90	Bh	g−1	11·1*b*
3570	45	Bh	a+1	9·3*b*	26	3689	,,	,,	g−3	11·3
3573	90	,,	=a	9·4	29	3692	...	Sa	=k	11·5
3577	60	D	a−1, d+4	9·5	29	3692	90	Wh	=g	11·0
3581	,,	,,	a−2, d+3	9·6	30	3693	150	Lp	g (2) v (2) h	11·1*b*
3582	34	Li	D (3) v (7) a	8·8	Oct 3	3696	...	Sa	=h	11·2
3582	...	Sa	=a, c+1	9·4	4	3697	120	Bn	=h	11·2
3592	90	Bh	=a	9·4*b*	4	3697	90	Bh	g−7, l+4	11·7
3593	100	Lp	=d	9·9*b*	7	3700	,,	,,	g−8, l+3	11·8
3594	90	Bh	a+1	9·3	11	3704	,,	,,	h−7, l+2	11·9
3597	60	D	a−4, d+1	9·8	11	3704	...	Sa	=l	12·1
3601	75	Gi	a+2·5	9·2	13	3706	100	Lp	h (2) v (2) k	11·3*b*
3603	100	Lp	e (1) v (4) f	10·2*b*	14	3707	120	Bn	=k	11·5
3605	60	D	d−1, e+2	9·9	15	3708	,,	D	k−4, l+2	11·9*b*
3606	100	Lp	e (2) v (2) f	10·3*b*	17	3710	90	Bh	h−7, l+2	11·9
3607	120	Bn	e (3) v (1) f	10·4	21	3714	,,	,,	h−6, l+3	11·8
3607	...	Sa	a−3, e−2, g+10	10·0	21	3714	120	Wi	l+2	11·9
3609	90	Bh	a+2	9·2*b*	23	3716	180	,,	=l	12·1*b*
3613	100	Lp	=f	10·5*b*	23	3716	...	Sa	=l	12·1
3613	60	D	e−1, f+3	10·2	25	3718	90	Bh	l+2	11·9
3614	,,	,,	e−2, f+2	10·3	30	3723	,,	Wh	=l	12·1
3614	44	Li	e (3) v (7) f	10·2	Nov 3	3727	,,	Bh	l+2	11·9
3617	60	D	e−3, f+1	10·4	3	3727	120	Wi	l+1	12·0
3619	100	Lp	f (2) v (3) g	10·7*b*	3	3727	150	Lp	=k	11·5
3620	...	Sa	=a	9·4	6	3730	120	Bn	k−5, l+1	12·0
3621	90	Bh	a+1	9·3	6	3730	...	Sa	g−6, l+4	11·6
3621	60	D	f−2, g+3	10·7	6	3730	90	Bh	l+1	12·0
3622	120	Bn	e (3) v (1) f	10·4	7	3731	60	D	l+4	11·7*b*
3626	44	Li	=e	10·1	16	3740	90	Bh	h−7, l+2	11·9
3627	100	Lp	f (2) v (1) g	10·8*b*	23	3747	,,	,,	h−4, l+5	11·6
3627	...	Sa	f−2, g+2	10·7	23	3747	...	Sa	<k	<11·5
3633	90	Bh	a−3	9·7	30	3754	90	Bh	h−2	11·4
3635	,,	,,	a−3, e+4	9·7	Dec 2	3756	,,	,,	g−3, l+8	11·3
3640	120	Bn	=f	10·5	3	3757	120	Bn	k (1) v (1) l	11·8
3641	90	Bh	a−2	9·6	3	3757	...	Sa	k−4, l+2	11·9
3643	100	Lp	f (4) v (1) g	10·9*b*	4	3758	90	Bh	h−1, l+8	11·3
3643	...	Sa	e−4, f−1, g+2	10·6	9	3763	,,	,,	=h	11·2
3643	60	D	f−2, g+4	10·6	9	3763	120	D	l+3	11·8*b*
3647	120	Bn	=f	10·5	18	3772	...	Sa	=h	11·2

pr. 22, 29, Orange.
ay 5, Difficult. May 25, Lp, 0c.
ne 23, Yellow.
ne 30, 7c.
ig. 9, Orange.

Aug. 22, D, About. 5-in. OG.
Sept. 11, Oct. 15, Difficult.
Nov. 7, Not sure. Difficult.
Dec. 9, D, Difficult.

(294) W CASSIOPEIÆ—*continued.*

1923 Dec					
18	3772	90	Bh	=g	11·0
22	3776	,,	,,	g+1	10·9
23	3777	120	Bn	h (1) v (1) k	11·3
24	3778	...	Sa	f−5, g+1	10·9*b*
24	3778	90	Bh	f−3, g+2	10·8
28	3782	,,	,,	=f	10·5
28	3782	...	Sa	=g, =h	11·1
30	3784	60	D	=h	11·2
31	3785	90	Bh	e−2, f+2	10·3
1924 Jan					
2	3787	120	Bn	f−4, g+1	10·9
2	3787	100	Lp	f (3) v (2) g	10·8*b*
3	3788	134	Sa	=h, k+2	11·2
3	3788	90	Wh	=f	10·5
3	3788	,,	Bh	a−6, d+5	9·7
6	3791	60	D	f−2, g+3	10·7
6	3791	44	Wi	d−3, e−1, f+3	10·2
6	3791	120	Bn	e−3, f+1	10·4
6	3791	100	Lp	f (2) v (2) g	10·7
6	3791	90	Bh	a−4, d+1	9·8
11	3796	,,	,,	a (2) v (1) e	9·9
11	3796	40	D	f+1	10·4
15	3800	,,	,,	e−1, f+3	10·2
16	3801	90	Sa	e−1, f+1	10·3
16	3801	,,	Bh	a (1) v (1) e	9·8
23	3808	,,	,,	a (1) v (2) e	9·7*b*
23	3808	40	D	a−2, e+4	9·7
25	3810	120	Bn	a−4, d+1	9·8
25	3810	90	Bh	a−1	9·5
27	3812	120	Wi	d−1, e+1	10·0
27	3812	100	Lp	=e	10·1
28	3813	40	D	a−3, d+2	9·7
31	3816	,,	,,	=a	9·4
31	3816	90	Bh	a+1	9·3
Feb					
1	3817	40	D	a+2	9·2
1	3817	120	Bn	a−3, d+2	9·7
3	3819	100	Lp	a (1) v (2) d	9·6*b*
4	3820	90	Bh	a+1	9·3
6	3822	64	Sa	a+2	9·2
8	3824	100	Lp	a (1) v (4) d	9·5
8	3824	60	D	a+3	9·1
11	3827	90	Bh	a+3	9·1
13	3829	40	D	a+5	8·9
14	3830	90	Bh	a+4	9·0
16	3832	50	Bn	a+3	9·1
16	3832	64	Sa	a+3	9·1
22	3838	100	Lp	a+1	9·3*b*
22	3838	90	Bh	a+5	8·9
23	3839	40	D	a+5	8·9
25	3841	150	Bh	a+5	8·9
26	3842	50	Bn	a+3	9·1
28	3844	34	Sa	a+3	9·1*b*
28	3844	90	Bh	a+5	8·9
Mar					
1	3846	45	,,	a+7	8·7
1	3846	34	Sa	a+5	8·9
2	3847	60	D	a+5	8·9
4	3849	40	,,	a+5	8·9
4	3849	120	Bn	a+2	9·2
4	3849	100	Lp	=a	9·4
4	3849	90	Bh	a+7	8·7
5	3850	33	Wi	a+4	9·0

Jan. 25, 31, Bh, Orange.
Mar. 4, D, 7°.

1924 Mar					
8	3853	120	Bn	a+2	
8	3853	40	D	a+5	
9	3854	45	Bh	a+8	
9	3854	44	Wi	a+3	
10	3855	,,	,,	a+2	
10	3855	64	Sa	a+4	
10	3855	100	Lp	v (2) a (2) d, a+2	
11	3856	33	Wi	a+3	
11	3856	40	D	a+6	
14	3859	,,	,,	a+6	
15	3860	45	Bh	a+8	
19	3864	90	,,	a+7	
19	3864	50	Bn	a+3	
20	3865	64	Sa	a+6	
23	3868	60	D	a+6	
24	3869	120	Wi	a+3	
29	3874	90	Bh	a+6	
29	3874	100	Lp	a+2	
29	3874	120	Bn	a+2·5	
30	3875	60	D	a+7	
30	3875	70	Wi	a+6	
31	3876	44	,,	a+7	
Apr					
4	3880	90	Bh	a+8	
4	3880	120	Bn	a+4	
5	3881	80	D	a+6	
7	3883	120	Wi	a+6	
7	3883	100	Lp	v (2) a (2) d, a+5	
8	3884	90	Bh	a+10	
9	3885	,,	Wi	a+6	
9	3885	50	Bn	a+3·5	
11	3887	90	Bh	a+10	
14	3890	64	Sa	a+7	
16	3892	150	Bh	a+10	
20	3896	100	Lp	a+10	
20	3896	120	Bn	a+3	
26	3902	45	Bh	a+8	
27	3903	80	Wi	a+5	
May					
1	3907	120	Bn	a+2	
3	3909	90	Bh	a+10	
5	3911	,,	,,	a+12	
5	3911	,,	Wi	a+6	
7	3913	60	D	a+6	
7	3913	90	Sa	a+7	
7	3913	120	Bn	a+2	
13	3919	60	D	a+6	
13	3919	90	Bh	a+12	
19	3925	120	Bn	a+3	
22	3928	150	Bh	a+12	
23	3929	90	Sa	a+7	
23	3929	60	D	a+4	
26	3932	,,	,,	a+5	
27	3933	100	Lp	=a	
31	3937	90	Bh	a+10	
June					
12	3949	,,	,,	a+6	
18	3955	,,	Sa	a+5	
19	3956	100	Lp	=e	
23	3960	45	Bh	a+8	
26	3963	60	D	a+1	

Mar. 8, D, 5°.
Apr. 5, 5°.
Apr. 8, Yellow.
May 26, 5°.
June 23, Yellow.

(294) W CASSIOPEIÆ—*continued.*

1924 June 27	3964	45	Bh	a+8	8·6
30	3967	90	,,	a+7	8·7
30	3967	100	Lp	=e	10·1*b*
July 4	3971	90	Bh	a+6	8·8
5	3972	60	D	a+2	9·2
9	3976	,,	,,	a+1	9·3
9	3976	90	Bh	a+5, d+10	8·9
11	3978	70	Bn	a+2	9·2
12	3979	60	D	=a	9·4
13	3980	100	Lp	=e	10·1*b*
14	3981	45	Bh	a+5	8·9*b*
19	3986	90	Wh	=e	10·1
21	3988	120	Bn	a−2, b−1	9·6
23	3990	45	Bh	a+6	8·8
24	3991	100	Lp	e (2) v (2) f	10·3
25	3992	90	Bh	a+5	8·9
29	3996	,,	,,	a+4	9·0
29	3996	121	Ha	a+2	9·2
29	3996	120	Bn	a−2, d+3	9·6
31	3998	60	D	a−2, d+4	9·6
Aug 2	4000	,,	,,	a−3, d+2	9·7*b*
2	4000	90	Wh	=e	10·1
3	4001	,,	Bh	a+4	9·0
5	4003	120	Bn	a−3, d+2	9·7
8	4006	60	D	a−1	9·5
8	4006	90	Bh	a+2	9·2
13	4011	60	D	a−1, d+4	9·5
18	4016	121	Ha	a (1) v (2) d	9·6
18	4016	100	Lp	a (2) v (2) d	9·7*b*
19	4017	80	Wi	d−1, e+1	10·0
19	4017	90	Bh	a+1	9·3
19	4017	120	Bn	e (2) v (1) f	10·4
19	4017	60	D	a−3, d+2	9·7
25	4023	64	Sa	a−1	9·5*b*
27	4025	60	D	=e	10·1
27	4025	90	Bh	a+1	9·3
31	4029	37	Lp	d+1	9·8
Sept 1	4030	64	Sa	=a	9·4
2	4031	90	Bh	a+1	9·3
3	4032	,,	Wh	=f	10·5
5	4034	60	D	d−2, e+1	10·0
8	4037	120	Bn	e−1, f+3	10·2
8	4037	90	Sa	=d	9·9
8	4037	,,	Bh	a−1	9·5
10	4039	121	Ha	a (3) v (2) e	9·8
16	4045	90	Bh	a−3, e+4	9·7
17	4046	64	Sa	a−5, d+3, e+3	9·7
19	4048	60	D	e−3, f+1	10·4
22	4051	100	Lp	f (2) v (2) g	10·7
23	4052	120	Bn	e (3) v (1) f	10·4
23	4052	60	D	=f	10·5
24	4053	90	Bh	=e	10·1
24	4053	64	Sa	f−1, g+6	10·5
1924 Oct 1	4060	121	Ha	f (2) v (3) g	10·7
1	4060	90	Sa	f−1, g+3	10·6
2	4061	,,	Bh	g+2	10·8
4	4063	94	Li	f (5) v (5) g	10·7
11	4070	90	Bh	=g	11·0*b*
12	4071	120	Bn	f−3, g+2	10·8
17	4076	100	Lp	g (2) v (2) k	11·2*b*
20	4079	121	Ha	f (3) v (2) g	10·8
23	4082	120	Bn	=g	11·0
23	4082	90	Bh	=h	11·2*b*
23	4082	94	Li	f (8) v (2) g	10·9
24	4083	121	Ha	f (4) v (1) g	10·9
31	4090	90	Wh	h (1) v (1) l	11·6
31	4090	,,	Bh	h−1	11·3*b*
Nov 3	4093	,,	Sa	=g	11·0
3	4093	44	Li	f (7) v (3) g	10·8*b*
4	4094	150	Lp	=k	11·5
4	4094	120	Bn	g (3) v (1) h	11·1
4	4094	60	D	h−4, l+7	11·5
4	4094	90	Bh	=h	11·2
5	4095	121	Ha	f (9) v (1) g	10·9
9	4099	120	D	k−4	11·9*b*
12	4102	193	Li	k (5) v (5) l	11·8
15	4105	90	Bh	h (1) v (2) l	11·5
19	4109	45	,,	h (1) v (1) l	11·6*b*
24	4114	90	,,	h (1) v (1) l	11·6
28	4118	134	Sa	=k	11·5
30	4120	120	D	k−5, l+2	11·9
30	4120	193	Li	k (5) v (5) l	11·8*b*
30	4120	120	Bn	k−2, l+4	11·7
Dec 2	4122	90	Bh	h (2) v (1) l	11·8
6	4126	121	Ha	h (4) v (1) k	11·4
6	4126	193	Li	k (3) v (7) l	11·7
9	3129	150	Bh	l+1	12·0
13	4133	134	Sa	=l	12·1
13	4133	193	Li	k (7) v (3) l	11·9
14	4134	121	Ha	k (2) v (3) l	11·7
14	4134	90	Bh	=l	12·1
19	4139	134	Sa	k−4, l+2	11·9
19	4139	90	Bh	=l	12·1
22	4142	,,	,,	l−1	12·2
24	4144	80	D	l+2	11·9
26	4146	90	Bh	=l	12·1*b*
26	4146	121	Ha	k (1) v (4) l	11·6
28	4148	60	D	k−5, l+1	12·0
28	4148	120	Bn	l+1	12·0
30	4150	150	,,	=l	12·1*b*
30	4150	,,	Lp	k (2) v (2) l	11·8
30	4150	90	Bh	=l	12·1

Oct. 4, 17, Difficult.

(7779) S CEPHEI. (V. 2.)

H.D. 213678.

Star A = B.D. + 77° 834, 7^{m}·18, **H.A., 54,** 248.

Date.	Julian Date.	Inst.	Observer.	Comparisons.	Deduced Mag.
1922 Aug					
24	3291	F	Wf	a−10, 7+6	8·4*c*
Sept					
10	3308	,,	,,	A−3, a+1	7·4
16	3314	,,	,,	a−8, e+6	8·3*b*
23	3321	,,	,,	A−6	7·8
Oct					
13	3341	,,	,,	a−6	8·0
1923 Jan					
4	3424	45	Bh	=2	8·2
8	3428	,,	,,	2−2, 7+6	8·4*b*
9	3429	22	Ni	2 (1) v (2) 3	8·3
14	3434	37	Lp	3 (2) v (2) 4	8·6
14	3434	45	Bh	2−3, 7+5	8·5
21	3441	...	Sa	2−5, 7+3, 9+10, 15+15	8·7
24	3444	...	,,	a−12, b−7, 2−4, d+4, 7+8	8·4
24	3444	45	Bh	2−5, 7+5	8·6
Feb					
3	3454	,,	,,	2−3, 7+5	8·5
3	3454	...	Sa	2−4, d+4, 7+7	8·4
4	3455	37	Lp	3 (4) v (1) 7, 7+1	8·9*b*
5	3456	,,	,,	=7	9·0
6	3457	22	Ni	3 (5) v (1) 7	9·0
8	3459	45	Bh	2−5, 7+5	8·6
16	3467	,,	,,	=7	9·0
17	3468	22	Ni	7 (3) v (3) 8	9·4
21	3472	37	Lp	7 (1) v (2) 9	9·3*b*
23	3474	45	Bh	7−2, 15+10	9·2
28	3479	,,	,,	7−3	9·3
Mar					
2	3481	,,	,,	7−5	9·5
2	3481	...	Sa	b−10, 7+3	8·8
6	3485	37	Lp	7 (3) v (1) 9	9·6*b*
13	3492	45	Bh	9−2, 15+2	10·0
17	3496	...	Sa	f−2, g+3, 15+7	9·5*b*
18	3497	22	Ni	=8	9·8
18	3497	45	Bh	15+1	10·1*b*
26	3505	90	,,	9−2, 15+2	10·0
30	3509	45	,,	9−1, 15+3	9·9*b*
Apr					
4	3514	22	Ni	=15	10·2
8	3518	90	Bh	=9	9·8
13	3523	45	,,	9−2, 15+2	10·0
17	3527	90	,,	9−5, 15−1	10·3
19	3529	...	Sa	15−3, =18	10·6
24	3534	45	Bh	15−4	10·6*b*
24	3534	22	Ni	15 (2) v (2) 18	10·5
28	3538	...	Sa	15−5, 18+1, 17+1	10·8*b*
May					
3	3543	...	,,	9−2, 15+1	10·1
3	3543	90	Bh	15−2	10
7	3547	45	,,	15−4	10
10	3550	90	,,	=18	10
10	3550	94	Ni	8 (3) v (1) 15	10
12	3552	...	Sa	15−3	10
17	3557	90	Bh	18−1	10
30	3570	45	,,	=18	10
June					
2	3573	,,	,,	15−2	10
23	3594	,,	,,	15−2	10
July					
4	3605	100	Lp	=15	10
5	3606	90	Bh	9−4, =15	10
6	3607	...	Sa	9−4, =15, 18+5	10
6	3607	37	Lp	=15	10
6	3607	94	Ni	7 (2) v (4) 8	9
8	3609	90	Bh	9−2, 15+2	10
13	3614	100	Lp	9+1	9
14	3615	90	Bh	=9	9
14	3615	22	Ni	8 (3) v (1) 15	10
18	3619	100	Lp	=9	9
19	3620	...	Sa	7−5, 9+3	9
20	3621	90	Bh	=7	9
25	3626	45	,,	=7	9
25	3626	...	Sa	d−10, 7−5, 9+3, 15+7	9
26	3627	100	Lp	7 (4) v (1) 9	9
30	3631	90	Bh	=7	9
Aug					
1	3633	,,	,,	=7	9
1	3633	...	Sa	7−4, f−4, 9+5	9
3	3635	45	Bh	=7	9
4	3636	22	Ni	=8	9
9	3641	45	Bh	7+2, f+5	8
11	3643	37	Lp	7 (4) v (1) 9, 9+2	9
13	3645	,,	,,	7 (7) v (3) 9	9
15	3647	...	Sa	7−5, 9+1, 15+4	9
16	3648	45	Bh	=7	9
18	3650	37	Lp	7 (7) v (3) 9	9
22	3654	45	Bh	=7	9
26	3658	100	Lp	7 (3) v (2) 9, f (1) v (2) 9	9
28	3660	...	Sa	7−4, f+2, 9+2	9
30	3662	37	Lp	7 (2) v (1) 9	9
31	3663	45	Bh	=7	9
Sept					
2	3665	,,	,,	7+2	8
3	3666	22	Ni	7 (5) v (1·5) 8	9

Aug. 24, Very red.
Jan. 9, Difficult.
Mar. 18, Apr. 4, Ni, Difficult.
May 10, Ni, With 22, 10·9.
July 6, Ni, With 22, 10·4*b*. Difficult.
July 13, Ruddy.
Aug. 1, Sa, Very red and difficult.
Aug. 4, Difficult.
Aug. 11, 13, Very ruddy.
Sept. 3, Ni, Difficult.

(7779) S CEPHEI—*continued.*

1923					
Sept					
4	3667	37	Lp	7 (3) v (2) 9, f (1) v (2) 9	9·5*b*
9	3672	100	,,	7 (2) v (2) 9	9·4*b*
10	3673	45	Bh	7+2	8·8
13	3676	22	Ni	7 (7) v (0·5) 8	9·7
13	3676	...	Sa	7−6, 9+3	9·6
16	3679	37	Lp	7 (2) v (2) 9	9·4*b*
16	3679	45	Bh	=7	9·0
21	3684	,,	,,	=7	9·0
29	3692	...	Sa	7−2, f+2, 9+5	9·3
30	3693	100	Lp	7 (2) v (1) 9	9·6
30	3693	90	Bh	7−2	9·2
Oct					
1	3694	,,	,,	7−3	9·3
5	3698	45	,,	7−2, =f	9·3
9	3702	22	Ni	=15	10·2
11	3704	...	Sa	=9	9·8
12	3705	45	Bh	7−4	9·4
13	3706	37	Lp	=9	9·8*b*
14	3707	...	Sa	9−2, 15+2	10·0
21	3714	...	,,	a−15, 2−10, 7+4	8·9
21	3714	45	Bh	7−2, f+1	9·3
25	3718	,,	,,	7−2	9·2
Nov					
3	3727	100	Lp	7 (2) v (1) 9	9·6
7	3731	...	Sa	2−6, 7+3, 9+8	8·8
7	3731	90	Bh	9+3	9·5
8	3732	22	Ni	7 (6) v (2) 8	9·6
9	3733	45	Bh	7−4, 9+4	9·4
12	3736	,,	,,	=7	9·0
16	3740	22	Ni	=7	9·0
18	3742	100	Lp	7 (1) v (2) 9	9·3*b*
23	3747	...	Sa	a−7, =2, 7+10	8·1
23	3747	45	Bh	=7	9·0
30	3754	,,	,,	=7	9·0
Dec					
3	3757	...	Sa	a−6, =2, 7+8	8·1
4	3758	45	Bh	7+2	8·8
8	3762	,,	,,	7+3	8·7
8	3762	...	Sa	a−5, =b, 2−2, 7+8	8·1
9	3763	22	Ni	=7	9·0
13	3767	...	Sa	a−6, b+2, 2+5	7·8
15	3769	100	Lp	2 (2) v (1) 7, =3	8·7*b*
15	3769	22	Ni	3 (4) v (2) 7	8·9
18	3772	45	Bh	=2	8·2
19	3773	100	Lp	2 (2) v (1) 7, =3	8·7*b*
22	3776	...	Sa	a−8, b−3, =2, 7+10	8·1
22	3776	45	Bh	=2	8·2
24	3778	,,	,,	a−1, =2, 7+8	8·0
28	3782	,,	,,	=3, 7+5	8·5
28	3782	...	Sa	b−1, =2, 7+6	8·2
30	3784	22	Ni	3 (3) v (3) 7	8·8
1924					
Jan					
2	3787	100	Lp	2 (2) v (1) 7	8·7*b*
3	3788	34	Sa	a−10, =2, 7+7	8·3
3	3788	45	Bh	7+5	8·5
5	3790	,,	,,	2+2, 7+8	8·1
7	3792	,,	,,	=2	8·2
11	3796	,,	,,	2−2, 7+7	8·3
12	3797	22	Ni	3+1	8·5
1924					
Jan					
16	3801	34	Sa	b−2, 2−3, 7+10	8·2*b*
17	3802	45	Bh	2+2	8·0
20	3805	,,	,,	2+3	7·9
23	3808	,,	,,	2+2	8·0
25	3810	22	Ni	3+1	8·5*b*
26	3811	90	Bh	1 (1) v (2) 3	8·1
27	3812	37	Lp	2 (2) v (2) 3	8·4
27	3812	34	Sa	a−7, =b, =2, 7+7	8·1
Feb					
4	3820	37	Lp	2 (2) v (2) 7, =3	8·6*b*
4	3820	45	Bh	2−2, 3+2	8·4
6	3822	34	Sa	a−12, b−2, 2−2, 7+8	8·3
8	3824	37	Lp	2 (3) v (2) 7	8·7
14	3830	22	Ni	2 (3) v (3) 3	8·4
14	3830	45	Bh	2−3, 7+6	8·4
16	3832	34	Sa	a−3, =b, =2, 7+8	8·0*b*
21	3837	90	Bh	2+1, 7+10	8·0
24	3840	45	,,	=2, 7+8	8·2
27	3843	34	Sa	2−5, 7+4	8·6
28	3844	22	Ni	=3	8·6
28	3844	45	Bh	=2, 7+10	8·1
Mar					
1	3846	,,	,,	=2	8·2
3	3848	34	Sa	2−4, 7+6	8·5
4	3849	37	Lp	2 (3) v (2) 7	8·7
4	3849	45	Bh	2−2	8·4
5	3850	22	Ni	2 (4) v (1) 3	8·5
7	3852	45	Bh	2 (1) v (1) 3	8·4
9	3854	22	Ni	2 (4) v (1) 3	8·5
10	3855	34	Sa	2−1, 7+7	8·3
10	3855	100	Lp	7+2	8·8*b*
15	3860	45	Bh	2 (1) v (3) 7	8·4
22	3867	,,	,,	2−2, 7+5	8·4*b*
26	3871	,,	,,	=2	8·2
28	3873	,,	,,	=3	8·6
29	3874	100	Lp	2 (2) v (2) 7	8·6*b*
30	3875	42	Si	4 (2) v (3) 7	8·8
30	3875	22	Ni	3 (3) v (4) 7	8·8*b*
Apr					
6	3882	45	Bh	7−1	9·1
7	3883	37	Lp	2 (4) v (1) 7	8·9*b*
7	3883	42	Si	=3	8·6*b*
11	3887	45	Bh	7+2	8·8
14	3890	34	Sa	7+2	8·8
16	3892	45	Bh	=3	8·6
20	3896	,,	,,	=3	8·6
20	3896	37	Lp	=7	9·0*b*
25	3901	45	Bh	=3, 7+5	8·6
29	3905	22	Ni	=7	9·0*b*
May					
3	3909	45	Bh	3−3	8·9
5	3911	,,	,,	3−3	8·9
7	3913	22	Ni	7 (2) v (3) 8	9·3
7	3913	34	Sa	7−6, =f, 9+6	9·4
10	3916	45	Bh	3−2	8·8
13	3919	,,	,,	3−4, 7+1	9·0
20	3926	100	Lp	7 (1) v (2) 9	9·3*b*
22	3928	45	Bh	=7	9·0
23	3929	34	Sa	7−3, f−5, 9+3, 15+5	9·6

Sept. 9, Very difficult.
Sept. 13, Oct. 9, Ni, Difficult.
Sept. 16, 30, Lp, Difficult.
Nov. 16, Difficult. Nov. 30, Unsteady.

Jan. 25, Difficult.
Jan. 27, Lp, Ruddy.
Mar. 29, Very red.
Mar. 30, Ni, Difficult.
Apr. 29, About. Difficult. Unsteady.

(7779) S CEPHEI—*continued.*

1924					
May					
24	3930	22	Ni	7 (2) v (3) 8	9·3
26	3932	45	Bh	=d, 7+3	8·7
27	3933	,,	,,	3−2, 7+3	8·8
27	3933	42	Si	=4	8·7
28	3934	37	Lp	7 (2) v (3) 9	9·4*b*
June					
11	3948	90	Bh	7−4	9·4
13	3950	45	,,	6 (1) v (1) 14, 8+3	9·6
13	3950	34	Sa	7−1, f+2	9·2
18	3955	90	Bh	=8, =9	9·8
23	3960	100	Lp	7 (9) v (1) 9	9·8*b*
23	3960	42	Si	=6	9·1*b*
27	3964	34	Sa	7−3, =f, 9+6	9·3
27	3964	90	Bh	9 (1) v (1) 12, =11	10·0
30	3967	45	,,	=8, =9	9·8
July					
6	3973	22	Ni	15−1	10·3*b*
9	3976	90	Bh	5 (3) v (1) 8	9·6
14	3981	45	,,	6 (1) v (1) 8	9·4*b*
19	3986	,,	,,	5 (1) v (1) 8	9·3
24	3991	37	Lp	15 (2) v (2) 18	10·5
26	3993	22	Ni	=8	9·8*b*
29	3996	90	Bh	5−3	9·2
31	3998	45	,,	5−3, 6−2	9·2
Aug					
3	4001	,,	,,	7−3, 6−2, 8+7	9·2
5	4003	100	Lp	=9	9·8
8	4006	60	Si	9 (2) v (3) 15	10·0
8	4006	90	Bh	7−4, 9+4	9·4
12	4010	60	Si	9 (2) v (3) 15	10·0
15	4013	45	Bh	=7	9·0*b*
15	4013	34	Sa	f−5, =9, 15+4	9·8
19	4017	45	Bh	=7	9·0
22	4020	60	Si	8 (2) v (3) 15	10·0
27	4025	34	Sa	9−2, 15+2	10·0
27	4025	45	Bh	4−4, 5−2, =7	9·1
31	4029	37	Lp	9 (2) v (2) 15	10·0*b*
Sept					
2	4031	45	Bh	=7	9·0
3	4032	64	Sa	9−3, 15+1	10·1
5	4034	60	Si	=8	9·8
9	4038	45	Bh	7+2	8·8*b*
14	4043	,,	,,	=7	9·0*b*
16	4045	,,	,,	4 (1) v (1) 7, =5	8·9*b*
17	4046	34	Sa	7−5, f−4, 9+2	9·7
22	4051	100	Lp	15 (1) v (4) 18	10·3
22	4051	60	Si	=6	9·1

July 6, 26, Difficult.
Aug. 5, Very ruddy.
Aug. 31, Difficult. Very red.
Sept. 22, Si, Very red.

1924					
Sept					
24	4053	34	Sa	7−5, =f, 9+2, 15+8	9
24	4053	45	Bh	7−2	9
28	4057	60	Si	=5	8
29	4058	45	Bh	4 (2) v (1) 9	9
Oct					
1	4060	34	Sa	=9	9
11	4070	45	Bh	7−4	9
14	4073	60	Si	4 (3) v (2) 7	8
17	4076	45	Bh	7−5	9
23	4082	100	Lp	9 (3) v (2) 15	10
23	4082	34	Sa	=9	9
23	4082	22	Ni	8 (4) v (1) 15	10
23	4082	60	Si	7 (3) v (2) 8	9
28	4087	,,	,,	7 (3) v (2) 8	9
31	4090	45	Bh	7−2	9
Nov					
3	4093	34	Sa	f−4, =9, 15+2	9
4	4094	75	Lp	=9	9
4	4094	22	Ni	7 (4) v (2) 8	9
4	4094	45	Bh	7+1	8
8	4098	,,	,,	4+1, 7+4	8
16	4106	,,	,,	=4	8
17	4107	60	Si	5 (3) v (2) 8	9
17	4107	22	Ni	7 (6) v (1) 8	9
19	4109	45	Bh	4+2	8
27	4117	,,	,,	=7	9
28	4118	,,	,,	7−2	9
28	4118	90	Sa	9−1, 15+3	9
29	4119	45	Bh	7 (2) v (1) 9	9
30	4120	60	Si	=9	9
Dec					
5	4125	45	Bh	=9	9
6	4126	,,	,,	9−1, 15+3	9
14	4134	,,	,,	7 (1) v (1) 9	9
14	4134	34	Sa	7+2	8
14	4134	75	Lp	7 (2) v (1) 8	9
19	4139	45	Bh	7 (3) v (1) 9	9
19	4139	60	Si	=9	9
22	4142	,,	,,	=9	9
22	4142	22	Ni	7 (2) v (2) 8	9
25	4145	45	Bh	=5	8
26	4146	22	Ni	7 (3) v (3) 8	9
26	4146	34	Sa	7−4, =f, 9+3	9
26	4146	60	Si	=9	9
30	4150	45	Bh	7+1	8
30	4150	75	Lp	7 (1) v (2) 8	9

Oct. 23, Ni, Unsteady.
Dec. 26, Ni, Difficult.

(7609) T CEPHEI. (V. 3.)

H.D. 210868.

Star C = B.D. + 69° 1198, 6^{m}·42, **H.A., 50,** 184.
,, D = ,, + 69° 1127, 6·52, ,, **50,** 177.
,, S = ,, + 67° 1329, 6·8 (B.D. value).

Date.	Julian Date.	Inst.	Observer.	Comparisons.	Deduced Mag.
1920					
Jan					
1	2325	90	Bh	=d	6·7
1	2325	40	Th	d−3	7·0*b*
2	2326	25	AB	f−2, h+2	7·9
8	2332	23	Bo	d (1) v (1) e	6·9
8	2332	90	Bh	=d	6·7
8	2332	50	Ma	d (2) v (3) h	7·3
9	2333	22	Ni	e (5) v (1) f	7·6
13	2337	45	Br	d+1	6·6
13	2337	90	Bh	d+2	6·5
13	2337	62	Th	d−5, f+5	7·2
14	2338	23	Bo	d (1) v (3) e	6·8
15	2339	90	Bh	d+2	6·5
16	2340	F	AB	f−2, h+3	7·9
18	2342	25	,,	f−3, h+3	7·9
19	2343	23	Bo	d (1) v (3) e	6·8
19	2343	30	Bn	d (4) v (1) e	7·0
19	2343	50	Ma	d (4) v (1) h	7·8
21	2345	,,	,,	h+2	7·9
21	2345	45	Bh	d−1	6·8*b*
22	2346	25	AB	f−2·5, h+3	7·9
23	2347	23	Bo	d (1) v (4) e	6·8
23	2347	90	Bh	d−3	7·0
23	2347	22	Ni	e (2) v (2) f	7·4
24	2348	62	Th	d−3	7·0
24	2348	50	Ma	d (3) v (1) h, h+2·5	7·8
24	2348	30	Bn	d (4) v (1) e	7·0
25	2349	25	AB	f−3, h+2	8·0
27	2351	90	Bh	d−3	7·0
29	2353	23	Bo	=d	6·7*b*
29	2353	F	AB	f−2, h+3	7·9
Feb					
3	2358	25	,,	=f	7·7*b*
3	2358	23	Bo	=d	6·7
3	2358	22	Ni	d (6) v (1) e	7·1
4	2359	45	Bh	d−3	7·0
5	2360	25	AB	e−3, f+1	7·5
6	2361	,,	Bn	d (3) v (1) e	7·0
6	2361	B	Ni	e (4) v (1) f	7·6
7	2362	23	Bo	=d	6·7
7	2362	F	AB	e−3, =f	7·6
8	2363	62	Th	=e	7·1
8	2363	50	Ma	d (3) v (7) h	7·1
10	2365	45	Bh	d+1	6·6
11	2366	,,	,,	d+2	6·5
11	2366	23	Bo	d (1) v (3) e	6·8
13	2368	25	AB	e−3, f+2	7·5
15	2370	23	Bo	d+1	6·6
15	2370	90	Bh	d+2	6·5

Jan. 1, Bh, Pale yellow. Not sharp.
Jan. 8, Bh, Pale yellow.
Jan. 8, 19, Ma, Pale red.
Jan. 21, 24, Ma, Pale pink.
Feb. 8, Ma, Pale pink.
Feb. 15, Bh, Yellow.

Date.	Julian Date.	Inst.	Observer.	Comparisons.	Deduced Mag.
1920					
Feb					
16	2371	30	D	d−5, e−2, f+4	7·3
17	2372	,,	Bn	d+1	6·6
17	2372	50	Ma	d (1) v (4) h	7·0
17	2372	B	Ni	e (2) v (3) f	7·3
18	2373	,,	Bo	c (7) v (1) d	6·6
18	2373	25	AB	e−3, f+2	7·5
21	2376	45	Br	d+4	6·3
22	2377	B	Bo	d (1) v (9) e	6·7*b*
23	2378	,,	,,	c (9) v (1) d	6·6
23	2378	90	Bh	d+3	6·4
23	2378	B	Ni	d (1) v (2) e	6·8
23	2378	50	Ma	d (1) v (9) h	6·8
26	2381	,,	,,	d+1	6·6
27	2382	B	Bo	c (4) v (1) d	6·6
28	2383	90	Bh	d+4	6·3
29	2384	25	AB	=d, e+5	6·7
Mar					
2	2386	30	Bn	d+2	6·5
3	2387	25	AB	d+2	6·5
7	2391	50	Bn	d+2	6·5
7	2391	90	Bh	d+5	6·2
8	2392	62	Th	d+2	6·5
8	2392	B	Bo	c (3) v (1) d	6·5*b*
12	2396	,,	,,	c (2) v (1) d	6·5*b*
12	2396	50	Bn	d+2	6·5
13	2397	45	Bh	d+5	6·2
15	2399	B	Ni	d+3	6·4
16	2400	25	AB	d+2·5	6·4
17	2401	90	Bh	d+1	6·6
18	2402	45	Br	d+6	6·1
18	2402	50	Bn	d+3	6·4
18	2402	25	AB	c−5, d+3	6·5
19	2403	B	Bo	c (1) v (2) d	6·3
19	2403	30	D	d+2	6·5*b*
20	2404	50	Bn	d+2	6·5
20	2404	F	AB	d+3	6·4
21	2405	90	Bh	d+2	6·5
22	2406	B	D	c−5, d+3	6·5
25	2409	45	Bh	d+2	6·5
26	2410	F	AB	c−5, d+4	6·4
30	2414	B	Bo	c (1) v (3) d	6·2*b*
31	2415	50	Bn	d+2	6·5
Apr					
6	2421	B	Bo	c (1) v (3) d	6·2*b*
7	2422	25	AB	d+2	6·5
9	2424	90	Bh	d+2	6·5
10	2425	B	Ni	d+0·5	6·6
11	2426	F	AB	d+2	6·5*b*
12	2427	90	Bh	d+2	6·5
13	2428	30	D	d+5	6·2

Feb. 17, 23, Ma, Pale pink.
Feb. 26, Warm pink.
Mar. 7, 21, Bh, Orange.
Apr. 13, With B, 6·5.

(7609) T CEPHEI—*continued.*

1920					
Apr					
15	2430	B	Bo	c (3) v (1) d	6·5*b*
16	2431	,,	Ni	=d	6·7
20	2435	F	AB	d+1	6·6*b*
21	2436	45	Br	d+4	6·3
21	2436	30	Bn	d+2	6·5
21	2436	90	Bh	d−1	6·8
21	2436	30	D	d+3	6·4
22	2437	25	AB	d−1, e+3·5	6·8
24	2439	,,	,,	d−2, e+3	6·9
28	2443	30	Bn	=d	6·7
May					
3	2448	,,	,,	d−1	6·8
4	2449	45	Bh	d−5	7·2
5	2450	25	AB	d−6·5, e+2	7·1
7	2452	45	Br	d+2	6·5
7	2452	90	Bh	d−5, f+5	7·2
7	2452	30	D	d−2, e+2	6·9
9	2454	62	Th	d−3	7·0
9	2454	22	Ni	d (4) v (2) e	7·0
9	2454	25	AB	e−3, f+3	7·4
9	2454	30	Bn	d (1) v (3) e	6·8
10	2455	,,	D	d−3, e+2	7·0
12	2457	22	Ni	d (4) v (2) e	7·0
14	2459	30	D	e−0·5, f+5	7·2
14	2459	90	Bh	d−6, f+3	7·3
16	2461	25	AB	h+3	7·8
19	2464	30	Bn	d (1) v (2) e	6·8
21	2466	22	Ni	e (3) v (1·5) f	7·5
23	2468	90	Bh	d−5, f+5, g+10	7·2
23	2468	45	Br	d−1	6·8
25	2470	30	D	f−3, g+3	7·9*b*
26	2471	25	AB	f−3, =h	8·1
27	2472	,,	,,	f−2, h+3	7·9
29	2474	50	Bn	d (4) v (1) e	7·0
30	2475	25	AB	f−4, g+2	8·0
June					
6	2482	,,	,,	=g, k+5	8·2
8	2484	45	Br	d−5, f+5	7·2
8	2484	90	Bh	f+1	7·6
8	2484	30	D	f−3, g+1	8·0
8	2484	22	Ni	f (6) v (1) h	8·1
9	2485	50	Bn	d (5) v (1) e	7·0
10	2486	30	D	f−4, g+1	8·1*b*
15	2491	,,	,,	f−5, g+1	8·1*b*
15	2491	45	Bh	f−3, g+1	8·0*b*
18	2494	,,	,,	f−3, g+2	8·0
19	2495	45	Br	f+1	7·6
19	2495	50	Bn	f (1) v (2) g	7·9
20	2496	25	AB	g−3, k+3	8·5
22	2498	30	D	=g	8·2
22	2498	25	AB	g−4, k+2	8·6
23	2499	45	Bh	f−5, =g	8·2
29	2505	90	,,	f−3, g+2	8·0
30	2506	30	D	g−4, k+3	8·5
July					
9	2515	,,	,,	l−1, m+3	9·3*b*
9	2515	22	Ni	h+8, k−2, l−3	8·6
11	2517	80	AB	=l, m+4	9·2
14	2520	30	D	l−3, m+2	9·5*b*
15	2521	50	Bn	g (4) v (1) k	8·7
15	2521	90	Bh	f−8, g−3, l+8	8·5
16	2522	80	AB	l−3·5, m+2	9·5

Apr. 21, D, With B, 6·7.
May 9, Ni, With B, 7·0.
June 19, Br, Reddish.
June 29, Pale yellow.

1920					
July					
16	2522	22	Ni	l (1) v (4) m	9
18	2524	45	Br	g−5, l+5	8
19	2525	30	D	l−3, m+1	9
19	2525	50	Ma	=l	9
20	2526	80	AB	l−3, m+2	9
24	2530	50	Bn	k (7) v (2) m	9
27	2533	90	Bh	f−10, g−6, l+4	8
29	2535	80	AB	m−2, n+4	9
30	2536	45	Br	=l	9
30	2536	90	Bh	=l, =15	9
Aug					
2	2539	80	AB	m−3, n+4	9
3	2540	22	Ni	m (2) v (3) n	9
6	2543	45	Bh	l−3, 15−3, 21+1	9
7	2544	80	AB	m−3, n+3·5	9
9	2546	75	Bn	m (1) v (1) n	9
12	2549	25	AB	=n, o+4·5	10
14	2551	45	Bh	m−1	9
15	2552	25	AB	n−2, o+4	10
17	2554	23	Bo	=m	9
19	2556	160	Br	m−3, n+2	9
20	2557	75	Bn	m (3) v (1) n	10
20	2557	90	Bh	m−4, n+1	10
21	2558	25	AB	n−3·5, o+2	10
23	2560	50	Ma	m+1, 21+1	9
26	2563	80	AB	n−2, o+2	10
26	2563	90	Bh	n+1	10
29	2566	,,	,,	m−3, n+2	9
30	2567	25	AB	n−3	10
Sept					
5	2573	,,	,,	=o, p+4·5	10
5	2573	75	Bn	m (4) v (1) n	10
6	2574	45	Bh	n+1, o+5	10
8	2576	60	D	o−2, p+4	10
8	2576	23	Bo	m (2) v (1) n	10
8	2576	25	AB	o−2	10
9	2577	22	Ni	n−2	10
11	2579	75	Bn	n (1) v (2) o	10
11	2579	80	AB	o−3, p+3	10
12	2580	23	Bo	l (4) v (1) m	9
13	2581	90	Bh	m−5, =n	10
14	2582	80	AB	o−2, p+5	10
16	2584	90	Bh	m−5, n+1	10
16	2584	22	Ni	n−3	10
18	2586	95	Bn	n (2) v (1) o	10
19	2587	23	Bo	m (1) v (1) n	9
19	2587	80	AB	o−2, p+5	10
22	2590	,,	,,	o−4, p+4	10
27	2595	70	Bn	m (3) v (1) n	10
29	2597	55	Bo	m (1) v (3) n	9
Oct					
1	2599	22	Ni	n−2	10
2	2600	90	Bh	m−5, =n	10
3	2601	80	AB	n−4, o+2	10
4	2602	55	Bo	l (7) v (1) m	9
5	2603	60	D	n−1·5, o+2·5	10
8	2606	22	Ni	m (4) v (1) n	10
9	2607	55	Bo	l (4) v (1) m	9
10	2608	50	Bn	m (1) v (2) n	9
11	2609	30	D	m−4, n+1	10
12	2610	90	Bh	=n	10
13	2611	80	AB	m−4, =n	10
14	2612	55	Bo	l (3) v (1) m	9
15	2613	80	AB	n−2, o+4	10
16	2614	90	Bh	o+8	9

Sept. 8, D, Difficult. Not sure.

(7609) T CEPHEI—*continued.*

1920 Oct					
18	2616	22	Ni	m (3) v (2) n	9·9
18	2616	50	Ma	=m	9·7
18	2616	90	Bh	=m, n+5	9·6
18	2616	50	Bn	m+0·5	9·6
18	2616	45	Br	l−2, m+3	9·4
19	2617	55	Bo	l (1) v (2) m	9·3
22	2620	25	AB	m−4, n+3	9·9
23	2621	120	Bn	l (5) v (2) m	9·5
23	2621	22	Ni	m (1·5) v (2·5) n	9·8
25	2623	50	Ma	=l	9·2
25	2623	90	Bh	m+2	9·5
25	2623	55	Bo	g (3) v (1) k	8·6
25	2623	80	AB	m−1·5, n+5	9·7
29	2627	50	Bn	l−1	9·3
29	2627	80	AB	l−3, m+2·5	9·4
30	2628	90	Bh	l−2, m+4	9·3
30	2628	50	Ma	h (9) v (1) l	9·1
30	2628	55	Bo	g (1) v (1) k	8·5
31	2629	25	AB	l−2, m+3	9·4
Nov					
1	2630	30	D	k−5, l−1, m+3	9·3*b*
1	2630	22	Ni	l (2) v (2) m	9·4
3	2632	90	Bh	l−3, m+3	9·4
4	2633	55	Bo	g (1) v (3) k	8·3
4	2633	50	Bn	k (3) v (1) l	9·1
4	2633	25	AB	l−1, m+4	9·3
8	2637	55	Bo	f (3) v (1) g	8·1
9	2638	22	Ni	k (5) v (3) l	9·0
10	2639	25	AB	k−4, l−1	9·2
11	2640	50	Ma	=h	8·1
13	2642	90	Bh	l+2, m+6	9·0
13	2642	25	AB	k−3, l+1·5	9·1
16	2645	55	Bo	f (1) v (3) g	7·8
16	2645	22	Ni	=k	8·8
17	2646	25	AB	k−1, l+3	8·9
18	2647	45	Br	f−3, g+3	7·9
18	2647	50	Ma	=h	8·1
19	2648	90	Bh	f−5, =g	8·2*b*
20	2649	55	Bo	e (3) v (1) f	7·5
21	2650	50	Bn	e (4) v (1) f	7·6
22	2651	25	AB	k+1	8·7
22	2651	45	Bh	=f, g+5	7·7
23	2652	25	Bn	f (1) v (2) g	7·9
24	2653	90	Bh	f+3, g+8	7·4
25	2654	25	AB	g−5, k+2	8·6
30	2659	90	Bh	f+5, g+10	7·2
Dec					
1	2660	22	Ni	=k	8·8
1	2660	25	AB	g−4·5, k+3	8·6
3	2662	50	Ma	h+2	7·9
8	2667	90	Bh	d−5	7·2
9	2668	50	Ma	d (3) v (1) h	7·8
11	2670	45	Bh	d−3	7·0
12	2671	55	Bo	d (3) v (1) e	7·0
12	2671	50	Bn	e (3) v (1) f	7·5
16	2675	,,	Ma	d (4) v (1) h	7·8
17	2676	25	AB	=g	8·2
21	2680	45	Bh	d−5	7·2
22	2681	55	Bo	d (3) v (1) e	7·0
25	2684	90	Bh	d−2	6·9

Oct. 18, Ma, Reddish.
Oct. 25, 30, Ma, Red.
Nov. 11, Pale red.
Dec. 11, Pale yellow.
Dec. 21, Yellow.
Dec. 25, Orange.

1920 Dec					
28	2687	22	Ni	f (4) v (2) h	8·0
30	2689	30	Bn	f+1	7·6*b*
30	2689	F	AB	=g	8·2
31	2690	90	Bh	d−1	6·8
1921					
Jan					
5	2695	32	Ca	f−2, h+2	7·9
6	2696	90	Bh	d−3	7·0
7	2697	50	Ma	d (3) v (1) h	7·8
7	2697	45	Br	=d	6·7
7	2697	48	Wi	h+1	8·0*b*
9	2699	,,	,,	h+1	8·0*b*
9	2699	50	Ma	d (3) v (1) h	7·8
12	2702	48	Wi	d−7, g+7	7·4
12	2702	22	Ni	f (4) v (3) h	7·9
12	2702	30	Bn	e (5) v (2) f	7·5
13	2703	90	Bh	d−2	6·9
14	2704	,,	,,	d−3	7·0
14	2704	55	Bo	d (1) v (2) e	6·8
14	2704	50	Ma	d (2) v (1) h	7·6
14	2704	48	Wi	d−8, g+7	7·5
15	2705	,,	,,	d−10, g+5	7·7
16	2706	30	D	f−3, g+2	8·0
27	2717	20	Wi	f−3, g+2	8·0*b*
27	2717	55	Bo	d (1) v (3) e	6·8
29	2719	32	Ca	f−2, h+2	7·9
30	2720	30	D	f−4, g+1	8·1
30	2720	90	Bh	d−2	6·9
31	2721	55	Bo	c (7) v (1) d	6·6
31	2721	25	Bn	e (2) v (1) f	7·5*b*
31	2721	20	Wi	d−5, g+10	7·2
Feb					
2	2723	48	,,	d−3, g+11	7·0
2	2723	45	Bh	d−2	6·9
3	2724	48	Wi	d−4, g+10	7·1
5	2726	55	Bo	=d	6·7
9	2730	90	Bh	d−2	6·9
12	2733	22	Ni	e (4) v (2) f	7·5
14	2735	50	Bn	e (2) v (1) f	7·5
17	2738	90	Bh	=d	6·7
17	2738	45	Br	=d	6·7
19	2740	55	Bo	=d	6·7
19	2740	22	Ni	e (3) v (3) f	7·4
20	2741	50	Bn	e (1) v (3) f	7·3
20	2741	90	Bh	d+3	6·4
20	2741	48	Wi	d−5	7·2*b*
22	2743	,,	,,	d−4, g+10	7·1
24	2745	55	Bo	d (1) v (3) e	6·8
26	2747	B	Ni	f (2) v (2) h	7·9*b*
26	2747	50	Bn	e (1) v (3) f	7·3
27	2748	,,	Ma	d (1) v (1) h, h+5	7·5
28	2749	90	Bh	d+4	6·3
Mar					
2	2751	55	Bo	d (1) v (3) e	6·8
2	2751	50	Bn	e (2) v (7) f	7·2
2	2751	48	Wi	d−1	6·8
6	2755	45	Bh	=d	6·7
9	2758	B	Ni	e (3) v (3) h	7·6
10	2759	48	Wi	d−1	6·8
10	2759	90	Bh	=d	6·7
10	2759	50	Bn	e+1	7·0
10	2759	55	Bo	d+1	6·6

Dec. 31, Jan. 6, Orange.
Jan. 7, Ma, Pale red.
Jan. 14, Ma, Red.
Feb. 27, Pale pink.

(7609) T CEPHEI—*continued.*

1921					
Mar					
12	2761	B	Ni	e (2) v (4) f	7·3
15	2764	F	Bo	c (4) v (1) d	6·6
16	2765	90	Bh	d+2	6·5
17	2766	32	Ca	e−1, f+5	7·2
18	2767	50	Bn	d (1) v (2) e	6·8
18	2767	B	Ni	d(1·5) v (1·5) e	6·9
18	2767	48	Wi	d+4	6·3
21	2770	F	Bo	c (3) v (1) d	6·5
21	2770	45	Br	d+4	6·3
21	2770	,,	Bh	d+3	6·4
24	2773	,,	,,	d+2	6·5
24	2773	25	Bn	d+2·5	6·4
24	2773	48	Wi	d+5	6·2
29	2778	B	Ni	d+1·5	6·5
30	2779	F	Bo	c (1) v (2) d	6·3
30	2779	25	Bn	d+3	6·4
30	2779	48	Wi	d+4	6·3
Apr					
1	2781	,,	,,	d+5	6·2
1	2781	90	Bh	d+5	6·2
3	2783	55	Bo	c (3) v (4) d	6·3
4	2784	30	Bn	d+3	6·4
4	2784	,,	D	d+5	6·2
6	2786	B	Ni	c (4) v (4) d	6·4
6	2786	32	Ca	d+4	6·3
7	2787	F	Bo	b (4) v (1) c	5·9*c*
7	2787	30	Bn	d+4	6·3
7	2787	90	Bh	d+5	6·2
8	2788	48	Wi	d+7	6·0
10	2790	,,	,,	d+6	6·1
10	2790	90	Bh	d+5	6·2
11	2791	B	D	b−4, c+1	5·9
11	2791	B	Ni	c (1) v (6) d	6·1
12	2792	F	Bo	c (1) v (3) d	6·2
12	2792	30	Bn	d+5	6·2
12	2792	48	Wi	d+5	6·2
14	2794	,,	,,	d+6	6·1
15	2795	B	D	b−4, c+0·5	6·0
15	2795	90	Bh	d+5	6·2
18	2798	F	Bo	=c	6·0*b*
21	2801	90	Bh	d+6	6·1
23	2803	,,	,,	d+8	5·9
23	2803	30	Bn	d+4·5	6·2
23	2803	48	Wi	d+7	6·0
26	2806	90	Bh	d+8	5·9
27	2807	30	Bn	d+5	6·2
27	2807	B	D	b−4, c+2	5·9
27	2807	48	Wi	d+6	6·1
28	2808	B	Ni	c (4) v (4) d	6·4
28	2808	45	Br	d+9	5·8
29	2809	B	Bo	c (1) v (3) d	6·2
29	2809	90	Bh	d+6	6·1
29	2809	B	D	b−5, c+1	6·0
30	2810	,,	,,	b−4, c+1	5·9
30	2810	48	Wi	d+5	6·2

Mar. 21, Br, Very orange red.
Mar. 30, Bn, With B, 6·5.
April 4, Bn, With B, 6·5. D, With B, 6·4.
April 7, Bo, With B, 5·9*c*. Bn, With B, 6·4.
April 12, Bn, With B, 6·2.
April 14, Orange.
April 21, 23, Bh, Orange.
April 23, Bn, With B, 6·4. Wi, Orange.
April 26, Yellow.
April 27, Bn, With B, 6·1.
April 28, Br, About. Very orange.

1921					
May					
1	2811	30	Bn	d+5	6·
3	2813	32	Ca	d+1	6·
3	2813	B	Ni	c (5) v (2·5) d	6·
8	2818	30	Bn	d+3	6·
8	2818	48	Wi	d+4	6·
9	2819	,,	,,	d+3	6·
9	2819	45	Bh	d+5	6·
10	2820	F	Bo	c (4) v (1) d	6·
12	2822	B	Ni	d+1·5	6·
13	2823	,,	D	c−5, d+3	6·
15	2825	30	Bn	d+3	6·
16	2826	90	Bh	d+4	6·
16	2826	30	D	d+2·5	6·
20	2830	F	Bo	c (2) v (1) d	6·
22	2832	50	Bn	d+1	6·
22	2832	30	D	d−2, e+4	6·
22	2832	48	Wi	=d	6·
23	2833	,,	,,	d−3	7·
23	2833	45	Bh	d+3	6·
28	2838	30	D	d−1, e+3	6·
28	2838	48	Wi	d−2	6·
29	2839	B	Ni	=e	7·
June					
1	2842	55	Bo	d+1	6·
1	2842	45	Br	d+2	6·
1	2842	32	Ca	e−5, f+1	7·
2	2843	90	Bh	d+2	6·
5	2846	30	D	e−2, f+5	7·
5	2846	B	Ni	e (4) v (1) f	7·
6	2847	50	Bn	d (1) v (3) e	6·
6	2847	48	Wi	d−4	7·
9	2850	,,	,,	d−5	7·
10	2851	90	Bh	=d	6·
11	2852	48	Wi	d−5	7·
14	2855	55	Bo	d (1) v (3) e, e (1) v (1) f	7·
15	2856	90	Bh	d+1	6·
16	2857	30	D	e−4·5, f+1·5	7·
17	2858	,,	Bn	d (5) v (2) e	7·
21	2862	90	Bh	=d	6·
23	2864	30	Bn	e (2) v (1) f	7·
24	2865	,,	D	e−5, f+0·5	7·
24	2865	22	Ni	f (2) v (4) h	7·
27	2868	90	Bh	d−3	7·
28	2869	30	D	f−2, g+3	7·
29	2870	50	Bn	f (1) v (3) g	7·
July					
2	2873	22	Ni	h (4) v (4) k	8·
2	2873	90	Bh	d−5	7·
4	2875	30	D	f−3, g+2	8·
5	2876	50	Bn	f (1) v (4) g	7·
7	2878	90	Bh	d−5	7·
7	2878	32	Ca	h−1, =g	8·
8	2879	30	D	f−4, g+2	8·
9	2880	48	Wi	g−1	8·
9	2880	25	Bn	f (2) v (1) g	8·
10	2881	22	Ni	h (4) v (5) k	8·
11	2882	30	D	=g	8·
11	2882	45	Bh	d−7, f+3	7·
13	2884	30	D	f−5, g+1	8·

May 1, With B, 6·1.
May 8, Bn, With B, 6·5. Wi, Orange.
May 28, D, Difficult. With B, 7·0.
June 14, Second estimate with F.
June 15, 27, Yellow.

(7609) T CEPHEI—*continued.*

1921 July					
20	2891	50	Bn	f (3) v (1) g	8·1
25	2896	30	D	g−4, k+2	8·6*b*
26	2897	90	Bh	d−10, f−2	7·8
29	2900	,,	,,	g+2	8·0
30	2901	30	D	g−5, k+2	8·6
Aug					
3	2905	,,	,,	g−4, k+2	8·6
4	2906	32	Ca	k−2, m+6	9·0
6	2908	30	D	k+0·5	8·7*b*
6	2908	90	Bh	=g	8·2
9	2911	30	Bn	g (4) v (1) k	8·7
11	2913	,,	D	k−5, m+3	9·3*b*
14	2916	90	Bh	f−10, g−5	8·7
18	2920	55	Bo	g (2) v (1) k	8·6
19	2921	22	Ni	=n	10·1*b*
24	2926	55	Bo	l (1) v (4) m	9·3
26	2928	30	D	=m	9·7
28	2930	22	Ni	l (5) v (1) m	9·6
30	2932	45	Bh	g−10, m+5	9·2
31	2933	55	Bo	l (3) v (2) m	9·5
31	2933	30	D	m−3, n+2	9·9*b*
Sept					
2	2935	,,	,,	m−2·5, n+3·5	9·8
3	2936	75	Bn	m (1) v (2) n	9·8
4	2937	32	Ca	m−1, n+4	9·7
4	2937	90	Bh	=m	9·7*b*
5	2938	,,	,,	m+1	9·6
5	2938	55	Bo	l (3) v (2) m	9·5
7	2940	75	Bn	m (1) v (2) n	9·8
7	2940	30	D	m−4, n+2	10·0
7	2940	22	Ni	m (4) v (0·5) n	10·1
7	2940	50	Ma	l (4) v (1) 21	9·8
7	2940	48	Wi	=m	9·7
8	2941	,,	,,	m+4, n+8	9·3
14	2947	60	D	m−4, n+1	10·0
21	2954	90	Bh	m−1	9·8
21	2954	55	Bo	l (1) v (1) m	9·4
22	2955	60	D	n+0·5	10·1
23	2956	22	Ni	m (4) v (1) n	10·0
25	2958	45	Br	=m	9·7
26	2959	55	Bo	l (3) v (2) m	9·5
27	2960	50	Bn	m (1) v (1) n	9·9
28	2961	45	Bh	m−1	9·8
28	2961	30	D	=n	10·1
Oct					
1	2964	22	Ni	n−1·5	10·3
1	2964	90	Bh	=m	9·7
1	2964	55	Bo	l (4) v (1) m	9·6
4	2967	50	Bn	m (2) v (1) n	10·0
5	2968	90	Bh	m+1	9·6
6	2969	55	Bo	l (4) v (1) m	9·6
6	2969	22	Ni	m (4) v (0·5) n	10·1
6	2969	48	Wi	m−3, n+1	10·0
7	2970	32	Ca	n−1, p+9	10·2
8	2971	120	Bn	m (2) v (1) n	10·0
14	2977	160	Br	=n	10·1
15	2978	55	Bo	m (3) v (2) n	9·9
15	2978	90	Bh	=m	9·7
17	2980	,,	,,	m−1	9·8
23	2986	,,	,,	m+1	9·6
23	2986	50	Bn	m (2) v (1) n	10·0
23	2986	,,	Ma	n−1, o+2·5	10·2
27	2990	90	Bh	=m	9·7
28	2991	50	Ma	n+1·5	10·0
29	2992	55	Bo	m (2) v (3) n	9·8

Oct. 28, Dull red.

1921 Nov					
6	3000	55	Bo	l (2) v (3) m	9·4
6	3000	50	Bn	m+1	9·6
7	3001	45	Br	m+2	9·5
7	3001	90	Bh	m−1	9·8
7	3001	50	Ma	l (1) v (2) 21	9·5
9	3003	55	Bo	l (1) v (4) m	9·3
10	3004	22	Ni	m (2) v (2) n	9·9
12	3006	45	Bh	m−2	9·9
15	3009	50	Ma	l (2) v (1) 21	9·7
17	3011	55	Bo	k (1) v (3) l	8·9
19	3013	32	Ca	m−1, n+4	9·7
22	3016	22	Ni	=m	9·7
22	3016	55	Bo	g (1) v (1) k	8·5
23	3017	90	Bh	m−1	9·8
23	3017	50	Ma	=l, m+2	9·3
25	3019	55	Bo	g (2) v (1) k	8·6
26	3020	90	Bh	=m	9·7
26	3020	22	Ni	k (6) v (1·5) m	9·5
27	3021	50	Bn	=k	8·8
Dec					
3	3027	90	Bh	m+2	9·5
3	3027	45	Br	f−3, g+3	7·9
4	3028	22	Ni	k (3) v (3) l	9·0
15	3039	90	Bh	g−10, m+3	9·3
17	3041	50	Ma	h+2	7·9
19	3043	90	Bh	g−7, m+7	8·9*b*
20	3044	48	Wi	f−10, g−5	8·7
22	3046	,,	,,	g−4	8·6
22	3046	50	Bn	e (3) v (1) f	7·5
23	3047	90	Bh	g−3	8·5
24	3048	22	Ni	h (2) v (4) k	8·3
25	3049	90	Bh	=g	8·2
25	3049	45	Br	f+2	7·5
26	3050	55	Bo	e (3) v (2) f	7·5
28	3052	22	Ni	h (3) v (3) k	8·5
29	3053	50	Ma	d (2) v (1) h, h+2	7·7
29	3053	90	Bh	f+2, g+8	7·4
29	3053	30	Bn	e (5) v (1) f	7·6
1922 Jan					
4	3059	45	Br	d−4	7·1
4	3059	30	Bn	e (7) v (1) f	7·6
6	3061	22	Ni	=h	8·1
6	3061	90	Bh	=f	7·7
8	3063	,,	,,	d−7, f+3	7·4
10	3065	30	Bn	e (5) v (1) f	7·6
10	3065	50	Ma	d (1) v (1) h	7·4
10	3065	48	Wi	f−4, g+1	8·1
11	3066	,,	,,	f−3, g+2	8·0
17	3072	30	Bn	e (3) v (1) f	7·5
18	3073	90	Bh	d−6, f+4	7·3
19	3074	22	Ni	=h	8·1
20	3075	48	Wi	=g	8·2
20	3075	90	Bh	d−6, f+4, g+9	7·3
22	3077	45	Br	d−2	6·9
Feb					
1	3087	48	Wi	f−2, g+3	7·9*b*
2	3088	90	Bh	d−5, f+5	7·2
7	3093	50	Ma	d (3) v (2) h	7·5

Nov. 7, Ma, Dull red.
Nov. 15, Red.
Nov. 23, Ma, Red.
Dec. 3, Bh, Yellow.
Dec. 17, Pale red.
Jan. 10, Ma, Pale pink red.
Feb. 7, Pale red.

(7609) T CEPHEI—*continued.*

1922 Feb					
9	3095	50	Ma	d (4) v (1) h, h+4	7·8
9	3095	,,	Bn	e (2) v (1) f	7·5
10	3096	90	Bh	d−4, f+6	7·1
17	3103	45	Br	d−3	7·0
18	3104	50	Bn	e (3) v (2) f	7·5
18	3104	48	Wi	f−1, g+4	7·8
19	3105	,,	,,	d−8, f+1	7·5
24	3110	25	Bn	e (2) v (1) f	7·5
25	3111	22	Ni	f (5) v (1·5) h	8·0
25	3111	30	D	f−1, g+4	7·8*b*
26	3112	45	Bh	d−3, f+7	7·0
26	3112	48	Wi	f−1, g+4	7·8
Mar					
4	3118	,,	,,	d−5, f+5	7·2
4	3118	90	Bh	d−2	6·9
7	3121	45	Br	d−2	6·9
7	3121	50	Bn	d−4, e+1	7·1
7	3121	48	Wi	d−2	6·9
9	3123	,,	,,	d−3	7·0
12	3126	25	Bn	d (3) v (1) e	7·0
14	3128	90	Bh	=d	6·7
17	3131	30	D	d−5, =e	7·2*b*
19	3133	45	Bh	d+2	6·5
20	3134	22	Ni	d (5) v (1) e	7·0
23	3137	32	Ca	e−4, f+2	7·5
25	3139	45	Br	d+3	6·4
25	3139	30	Bn	d (1) v (2) e	6·8
28	3142	90	Bh	d+3	6·4
31	3145	B	D	d−3, e+2	7·0*b*
31	3145	22	Ni	=d	6·7
Apr					
1	3146	30	Bn	d+1	6·6
14	3159	90	Bh	d+3	6·4
18	3163	45	,,	d+2	6·5
19	3164	B	Bn	c (2) v (1) d	6·5
19	3164	,,	Ni	c (5) v (3) d (1) S	6·5
19	3164	33	Wi	d+6	6·1
21	3166	,,	,,	d+7	6·0
24	3169	,,	,,	d+5	6·2
27	3172	B	Bn	c (1) v (1) d	6·4
29	3174	45	Br	d+6	6·1
29	3174	90	Bh	d+5	6·2
May					
1	3176	B	Ca	=C, D+1	6·4
2	3177	45	Bh	d+7	6·0
4	3179	B	Bn	c (1) v (3) d	6·2
4	3179	33	Wi	d+7	6·0
6	3181	,,	,,	d+6	6·1
8	3183	,,	,,	d+6	6·1
13	3188	B	Bn	c (1) v (3) d	6·2
14	3189	,,	Wi	=c	6·0*b*
17	3192	45	Bh	d+7	6·0
19	3194	44	Wi	d+4	6·3
21	3196	B	Ni	d (1) v (1) S	6·7
21	3196	,,	Bn	c (1) v (1) d	6·4
21	3196	,,	D	d+4	6·3
22	3197	,,	,,	c−4, d+3	6·4
22	3197	32	Ca	C−1, =D	6·5
24	3199	B	Co	c−5, d+2·5	6·5*b*

Mar. 31, D, Difficult. Ni, With B, 6·9.
April 1, With B, 6·6.
April 21, Orange.
May 6, With B, 6·2.
May 8, With B, 5·9.
May 19, With B, 6·2.
May 24, 27, Co, Difficult.

1922 May					
26	3201	B	Ca	C−1, =D	6·
27	3202	,,	Bn	c (2) v (1) d	6·
27	3202	45	Bh	d+5	6·
27	3202	B	Co	d+3	6·
28	3203	80	,,	d+4·5	6·
28	3203	45	Br	d+6	6·
28	3203	B	Wi	c−3, d+5	6·
29	3204	,,	Ca	=D, d+1	6·
29	3204	,,	Ni	d (1·5) v (1·5) S	6·
June					
1	3207	,,	Bn	c (4) v (1) d	6·
4	3210	50	,,	d+2	6·
4	3210	45	Bh	d+5	6·
5	3211	22	Ni	d+3	6·
12	3218	45	Bh	d+5	6·
15	3221	80	Co	d+1·5	6·
20	3226	,,	,,	=d	6·
25	3231	,,	,,	d−2	6·
29	3235	,,	,,	d−2	6·
29	3235	90	Bh	d+3	6·
July					
1	3237	32	Ca	d−1, e+4	6·
3	3239	80	Co	d−2·5	6·
7	3243	90	Bh	d+1	6·
10	3246	45	,,	=d	6·
11	3247	80	Co	e+0·5, f+5	7·
12	3248	22	Ni	=f	6·
14	3250	90	Bh	d−3	7·
18	3254	45	Br	d−3, f+6	7·
18	3254	80	Co	=f, g+3	7·
19	3255	50	Bn	f (2) v (3) g	7·
27	3263	45	Bh	d−6, f+4	7·
31	3267	80	Co	=k	8·
Aug					
2	3269	45	Br	f−1	7·
7	3274	30	Bn	f (4) v (1) g	8·
7	3274	80	Co	k+2, l+4	8·
12	3279	45	Bh	=g	8·
15	3282	22	Ni	h (6) v (1·5) k	8·
15	3282	80	Co	k−1, l+4	8·
17	3284	,,	,,	k−1	8·
17	3284	90	Bh	g−2	8·
18	3285	45	Br	=g	8·
19	3286	30	Co	k−2, l+4	8·
20	3287	,,	,,	k−1, l+4	8·
23	3290	,,	,,	k−2, l+4	8·
25	3292	22	Ni	k (3) v (3) l	9·
25	3292	90	Bh	g−4, m+10	8·
27	3294	30	Co	k−2, l+3	8·
29	3296	22	Ni	l (4) v (3) m	9·
31	3298	45	Bh	g−6, m+9	8·
31	3298	30	Co	k−2, l+3	8·
Sept					
11	3309	,,	,,	l−2, =m	9·
12	3310	,,	,,	m−1·5	9·
12	3310	45	Bh	m+5	9·
13	3311	22	Ni	m (2) v (2) n	9·
13	3311	44	Wi	m−2, n+4	9·
15	3313	30	Co	m−1	9·
18	3316	45	Bh	m+5	9·

May 28, Co, Rich orange red.
June 15, Pale orange red.
June 20, Orange.
June 25, Very dull orange.
June 29, Co, Deep orange.
July 3, Deep orange red.
July 11, Orange red.

(7609) T CEPHEI—*continued.*

1922 Sept					
20	3318	50	Bn	l (1) v (3) m	9·3
20	3318	30	Co	=m, n+4	9·7
24	3322	,,	,,	m−1, n+2	9·8*b*
Oct					
1	3329	45	Br	=m	9·7
4	3332	,,	Bh	m+2	9·5
6	3334	50	Bn	m (1) v (2) n	9·8
6	3334	30	Co	=n	10·1*b*
7	3335	90	Bh	=m	9·7
7	3335	22	Ni	=n	10·1*b*
8	3336	30	Co	=n	10·1
10	3338	,,	,,	n−1·5, o+3	10·2
12	3340	50	Bn	n+1	10·0
13	3341	30	Co	n−2	10·3
13	3341	90	Bh	m−3	10·0
13	3341	22	Ni	=n	10·1
13	3341	44	Wi	m−4, o+1	10·2
14	3342	,,	,,	=o	10·5
15	3343	30	Co	o+2	10·3*b*
18	3346	90	Bh	=n	10·1
22	3350	50	Bn	m (3) v (1) n	10·0
25	3353	90	Bh	m−2, n+2	9·9
25	3353	22	Ni	n−4	10·5
27	3355	30	Co	=o	10·5
28	3356	50	Bn	n (1) v (3) o	10·2
30	3358	30	Co	o+1	10·4*b*
30	3358	90	Bh	=n	10·1
Nov					
4	3363	,,	,,	n−2, o+2	10·3
4	3363	50	Bn	n (1) v (2) o	10·2
9	3368	30	Co	o−1·5	10·7
11	3370	90	Bh	n−3, o+1	10·4
13	3372	45	Br	n−2, o+2	10·3
13	3372	30	Co	=o	10·5
14	3373	90	Bh	n−3, o+1	10·4
15	3374	22	Ni	=n	10·1
15	3374	30	Co	=o	10·5
17	3376	,,	,,	o+1	10·4
18	3377	50	Bn	m (3) v (1) n	10·0
19	3378	90	Bh	=n	10·1
20	3379	50	Ma	n (1) v (1) o	10·3
23	3382	30	Co	o+2	10·3
24	3383	45	Br	=n	10·1
24	3383	50	Bn	m (2) v (1) n	10·0
24	3383	90	Bh	m−3, n+2	9·9
26	3385	22	Ni	n−2	10·3
27	3386	30	Co	n−1	10·2
29	3388	50	Ma	n (1) v (1) o	10·3
29	3388	90	Bh	m−1, n+3	9·8
Dec					
1	3390	45	Bh	=m	9·7
6	3395	90	,,	=m, n+4	9·7
6	3395	50	Bn	l (4) v (1) m	9·6
6	3395	,,	Ma	n+2	9·9
8	3397	30	Co	n−1·5	10·3
11	3400	45	Bh	m+1, n+6	9·5
14	3403	22	Ni	m (2) v (3) n	9·8
17	3406	90	Bh	m+3	9·4
17	3406	30	Co	m−1, n+1·5	9·9
19	3408	,,	,,	m−1, n+2	9·8
19	3408	22	Ni	=m	9·7
19	3408	50	Bn	k (4) v (1) l	9·1
19	3408	45	Br	l−1·5, m+3	9·3
20	3409	44	Wi	m+3	9·4
1922 Dec					
22	3411	30	Co	=m	9·7
24	3413	,,	,,	l−2, m+1	9·5
25	3414	90	Bh	=l, m+5, n+10	9·1
26	3415	30	Co	l−1, m+2	9·4
26	3415	,,	Bn	k (2) v (1) l	9·0
26	3415	44	Wi	l+1, m+5	9·1
29	3418	90	Bh	l+1	9·1
30	3419	22	Ni	k (4) v (3) l (3) m	9·2
1923 Jan					
3	3423	44	Wi	g−5	8·7
3	3423	30	Co	=k	8·8*b*
4	3424	90	Bh	l+2	9·0
4	3424	50	Ma	=h	8·1
6	3426	22	Ni	=k	8·8
6	3426	44	Wi	g−2	8·4
7	3427	34	Li	e (8) v (2) f	7·6
8	3428	90	Bh	f−10	8·7
8	3428	44	Wi	g−1	8·3
8	3428	30	Co	k+2	8·6*b*
9	3429	22	Ni	k (2) v (3) l	8·9
9	3429	50	Ma	h (3) v (1) l	8·9
10	3430	30	Bn	f (5) v (1) g	8·1
10	3430	45	Bh	f−8, g−2	8·4
10	3430	30	Co	=k	8·8
12	3432	,,	,,	k+1	8·7
12	3432	50	Ma	h+1	8·0
14	3434	30	Bn	f (2) v (1) g	8·0
14	3434	34	Li	e (3) v (7) f	7·3
16	3436	30	Co	g−2·5	8·4
16	3436	22	Ni	k (1) v (5) l	8·8
20	3440	45	Bh	=g	8·2
20	3440	50	Ma	h+2	7·9
20	3440	30	Bn	f (1) v (3) g	7·8
20	3440	34	Li	e (1) v (9) f	7·2
23	3443	30	Co	g+2	8·0
25	3445	,,	,,	e−4, f+1	7·6
25	3445	50	Bn	e (5) v (1) f	7·6
27	3447	90	Bh	d−10, =f	7·7
Feb					
4	3455	,,	,,	d−10, =f	7·7
4	3455	50	Bn	e (3) v (1) f	7·5
4	3455	30	Co	f+2	7·5*b*
6	3457	22	Ni	e−2, f+3, h+4	7·5
7	3458	45	Br	d−5, f+5	7·2
8	3459	90	Bh	d−7, f+3	7·4
11	3462	30	Co	e−1	7·2
13	3464	22	Ni	e (5) v (2) f	7·5
16	3467	30	Co	f+1	7·6
16	3467	90	Bh	d−6, f+4	7·3
21	3472	30	Co	=e	7·1
25	3476	90	Bh	d−7, f+3	7·4
26	3477	30	Co	e+1·5	7·0
Mar					
3	3482	,,	,,	=e	7·1
5	3484	,,	,,	=e	7·1
6	3485	50	Bn	d (3) v (2) e	6·9
8	3487	90	Bh	d−3, f+5	7·1

Oct. 6, Co, About.
Nov. 29, Ma, Suspicion of redness.

Jan. 3, 8, Co, 8c.
Jan. 4, Ma, Reddish.
Jan. 9, 20, Ma, Pale red.
Jan. 12, Ma, Red.
Jan. 23, 9c.
Feb. 6, With B, 8·1.
Feb. 13, With B, 7·7.
Feb. 16, Co, 8c.

(7609) T CEPHEI—*continued.*

1923					
Mar					
13	3492	90	Bh	d−2	6·9
16	3495	30	Co	e−2·5	7·4
16	3495	B	Ni	=h	8·1
17	3496	22	,,	f (1) v (4) h	7·8
17	3496	50	Bn	d (1) v (2) e	6·8
17	3496	90	Bh	d−6, f+4	7·3
18	3497	34	Li	=e	7·1
18	3497	30	Co	=e	7·1
24	3503	50	Bn	e+1	7·0*b*
25	3504	34	Li	d (4) v (6) e	6·9
25	3504	30	Co	=e	7·1
26	3505	,,	,,	d−1, e+3	6·8
26	3505	31	D	f−2, g+3	7·9
27	3506	B	Ni	e (2) v (3) f	7·3
28	3507	30	Co	d−1	6·8
Apr					
1	3511	90	Bh	d−5	7·2
3	3513	30	Co	=d	6·7
4	3514	B	Ni	e (3) v (2) f	7·5
4	3514	50	Bn	d (3) v (1) e	7·0
8	3518	B	Ni	d (4) v (1) e	7·0
8	3518	30	Bn	d (3) v (2) e	6·9
9	3519	90	Bh	d−5	7·2
13	3523	,,	,,	d−3	7·0
13	3523	30	Bn	d+1	6·6
14	3524	34	Li	d+1	6·6
14	3524	30	Co	=d	6·7
14	3524	44	Wi	d−1	6·8*b*
19	3529	30	Co	d+1	6·6
20	3530	B	Ni	d (1) v (3) e	6·8
22	3532	90	Bh	d+1	6·6
24	3534	30	D	d+2	6·5
24	3534	,,	Bn	d+2	6·5
24	3534	B	Ni	d (2) v (1) e	7·0
26	3536	30	Co	d+3	6·4
May					
3	3543	,,	,,	d+4	6·3
3	3543	90	Bh	d+5	6·2
4	3544	B	Ni	c (9) v (2) d	6·6
4	3544	44	Wi	=d	6·7
5	3545	,,	,,	d+2	6·5
5	3545	B	Bn	c (3) v (1) d	6·5
5	3545	,,	D	c−5, d+3	6·5
7	3547	45	Br	d+5	6·2
11	3551	B	Co	d+3·5	6·3
12	3552	44	Wi	d+4	6·3
12	3552	B	Li	b (5) v (5) c	5·8*b*
13	3553	30	D	d+5	6·2
16	3556	44	Wi	d+6	6·1
17	3557	60	Si	a (3) v (2) d	6·0*b*
17	3557	B	Bn	c (1) v (1) d	6·4
21	3561	,,	,,	c+1	5·9
21	3561	90	Bh	d+5	6·2
24	3564	B	Ni	c (1) v (6) d	6·1
25	3565	,,	D	b−5, c+1	6·0
25	3565	,,	Bn	c+1	5·9
June					
2	3573	90	Bh	d+7	6·0
4	3575	B	D	b−4, c+2	5·9*b*

Mar. 26, Co, 9c.
April 3, 8c.
April 14, Co, 6c.
April 24, D, With B, 6·6.
May 3, Co, 8c.
May 4, Wi, Difficult.
May 13, 5c, With B, 6·4.

1923					
June					
6	3577	B	D	b−4, c+0·5	6·
10	3581	30	,,	d+8	5·
11	3582	90	Bh	d+8	5·
18	3589	B	D	b−4, c+1	5·
21	3592	30	Co	d+6	6·
26	3597	,,	D	c−1	6·
July					
4	3605	,,	,,	d+4	6·
4	3605	50	Bn	c (2) v (1) d	6·
5	3606	90	Bh	d+2	6·
5	3606	30	Co	d+5	6·
5	3606	22	Ni	c (9) v (1·5) d	6·
7	3608	30	D	d+2	6·
8	3609	45	Bh	d+2	6·
10	3611	B	Ni	c (9·5) v (1·5) d	6·
11	3612	30	Co	d+5	6·
13	3614	,,	D	d+1	6·
20	3621	,,	,,	d−1, e+3	6·
20	3621	90	Bh	d+3	6·
20	3621	30	Co	d+3	6·
25	3626	,,	,,	d+1	6·
25	3626	50	Bn	d+1	6·
26	3627	60	Si	=d	6·
Aug					
1	3633	90	Bh	=d	6·
2	3634	30	Co	d−1	6·
3	3635	B	Ni	h+1	8·
4	3636	90	Bh	=d	6·
4	3636	50	Bn	d (1) v (1) e	6·
8	3640	,,	,,	d (1) v (3) e	6·
9	3641	90	Bh	d+1	6·
10	3642	30	Co	=f	7·
11	3643	,,	D	f−3, g+2	8·
11	3643	90	Bh	d+1	6·
11	3643	60	Si	d (3) v (2) e	6·
13	3645	25	Bn	d (2) v (3) e	6·
15	3647	90	Bh	d−2	6·
15	3647	30	Co	=f	7·
21	3653	,,	,,	h+2, =g	8·
22	3654	90	Bh	d−5	7·
24	3656	25	Bn	e (1) v (1) f	7·
26	3658	30	Co	g−2	8·
30	3662	,,	,,	g−3	8·
30	3662	50	Bn	f (2) v (1) g	8·
30	3662	90	Bh	d (1) v (1) g	7·
Sept					
2	3665	30	D	g−3, k+3	8·
3	3666	22	Ni	h (5·5) v (2·5) k	8·
3	3666	30	Co	g−4, k+3	8·
4	3667	90	Bh	=f	7·
5	3668	50	Bn	f (3) v (2) g	8·
5	3668	60	Si	f (3) v (2) g	8·
6	3669	30	Co	k+2	8·
8	3671	,,	D	g−5, k+2	8·
8	3671	45	Br	g+1	8·
9	3672	30	Co	k+2	8·

June 10, 6c, With B, 5·9.
June 21, 6c.
July 4, D, 6c·5.
July 5, Co, 7c.
July 7, 6c.
July 11, 20, Co, 7c.
July 20, D, 6c.
Aug. 15, Co, 9c.
Aug. 21, Scarlet.

(7609) T CEPHEI—*continued.*

1923 Sept					
10	3673	45	Bh	d (2) v (1) g	7·7
11	3674	30	Co	=k	8·8
11	3674	50	Bn	=g	8·2
12	3675	75	Pr	f−1, h+2	7·9
13	3676	22	Ni	k (2·5) v (2·5) l	9·0
13	3676	30	Co	k+2	8·6
14	3677	45	Bh	d (3) v (1) g	7·8*b*
15	3678	30	Co	k−2	9·0
16	3679	50	Ma	h−1	8·2
16	3679	,,	Bn	g (1) v (2) k	8·4
17	3680	30	Co	k−2	9·0
18	3681	,,	D	=k	8·8*b*
18	3681	80	Si	=k	8·8
22	3685	90	Bh	=g	8·2
23	3686	50	Bn	g (1) v (1) k	8·5
28	3691	30	Co	=l, m+2·5	9·3*b*
30	3693	,,	,,	=l	9·2
30	3693	,,	D	l−1, m+3	9·3
30	3693	90	Bh	g−2	8·4
30	3693	60	Si	=m	9·7
30	3693	45	Br	g−1	8·3
Oct 4	3697	50	Bn	g (3) v (1) k	8·6
5	3698	45	Bh	g−5, l+5	8·7
6	3699	22	Ni	l (1) v (1) m	9·4
8	3701	30	Co	m−3, n+2·5	9·9*b*
12	3705	,,	,,	m−3, n+2	9·9
12	3705	90	Bh	g−8, l+2	9·0
12	3705	50	Ma	l+1, n+1	9·5
14	3707	30	Co	m−4, n+2·5	10·0
14	3707	50	Bn	l (3) v (1) m	9·5
14	3707	75	Pr	h−2, g−1	8·3
15	3708	30	D	=m	9·7
17	3710	,,	Co	m−4, n+1·5	10·0
19	3712	90	Bh	l−1, m+4	9·3
21	3714	50	Ma	12 (1) v (1) l, m+2	9·1
22	3715	,,	Bn	l (2) v (1) m	9·5
25	3718	90	Bh	l−4, m+1	9·6
26	3719	22	Ni	m (3) v (1) n	10·0
28	3721	80	Si	n (3) v (2) o	10·3*b*
29	3722	30	Co	n−2	10·3
29	3722	,,	D	m−3, n+1·5	10·0
29	3722	90	Bh	=m	9·7
Nov 1	3725	,,	,,	=m	9·7
2	3726	30	D	m−3, n+1	10·0*b*
2	3726	,,	Co	n−3	10·4*b*
6	3730	50	Ma	n (1) v (4) o	10·2
7	3731	,,	Bn	m (3) v (2) n	9·9
7	3731	90	Bh	m+1	9·6
7	3731	75	Pr	k−3, l−2, m+6	9·2
7	3731	30	Co	n−3	10·4*b*
10	3734	,,	,,	n (2) v (2) o	10·3
10	3734	22	Ni	=n	10·1
10	3734	79	Ma	n+2, o+1	10·2
11	3735	90	Bh	m−1	9·8
14	3738	22	Ni	=n	10·1
14	3738	30	Co	n−2, o+2	10·3
16	3740	50	Bn	m (1) v (2) n	9·8
1923 Nov 16	3740	90	Bh	m−2, n+2	9·9
17	3741	30	Co	n−2, o+2	10·3*b*
18	3742	79	Ma	m (2) v (1) 24	10·0
24	3748	90	Bh	=n	10·1
25	3749	60	Si	=o	10·5
29	3753	30	Co	n−4, o+1	10·5
30	3754	50	Bn	n (2) v (1) o	10·4
30	3754	90	Bh	=n	10·1
Dec 1	3755	30	Co	n−4, o+1·5	10·4
4	3758	50	Bn	n (2) v (3) o	10·3
4	3758	,,	Ma	=n, o−1	10·4
4	3758	90	Bh	n−2, o+2	10·3
8	3762	,,	,,	m−6, n−1, o+3	10·2
9	3763	22	Ni	n−1	10·2
9	3763	30	D	o−2, p+4	10·7
9	3763	,,	Co	n−4, =o	10·5
9	3763	50	Ma	n (1) v (3) o	10·2
9	3763	160	Br	=n	10·1
15	3769	50	Bn	n (2) v (1) o	10·4
18	3772	90	Bh	n−2, o+2	10·3
20	3774	50	Bn	m (4) v (1) n	10·0
22	3776	90	Bh	=n	10·1
23	3777	50	Ma	n+1, o+2	10·2
24	3778	90	Bh	m−3, n+2	9·9
28	3782	,,	,,	=n	10·1
28	3782	160	Br	m−3, n+1·5	10·0
30	3784	22	Ni	=n	10·1
1924 Jan 2	3787	50	Bn	m (5) v (2) n	10·0
3	3788	90	Bh	n−1, o+2	10·3
6	3791	30	Co	n−4, =o	10·5
6	3791	33	Wi	n−1, o+3	10·2
6	3791	22	Ni	m (3) v (0·5) n	10·0
6	3791	30	D	m−3, n+2	9·9
6	3791	45	Br	=m	9·7
6	3791	50	Bn	m (3) v (2) n	9·9
11	3796	90	Bh	n−2, o+2	10·3
12	3797	22	Ni	m (3) v (1) n	10·0
14	3799	30	Co	=n, o+4	10·1*b*
15	3800	40	D	m−4, n+1	10·0
17	3802	90	Bh	n (1) v (3) o	10·2
20	3805	80	Co	m−1·5, n+2	9·9
23	3808	90	Bh	n+1	10·0
25	3810	22	Ni	m (3) v (1) n	10·0
25	3810	30	Co	=m, n+2·5	9·8
25	3810	50	Bn	l (4) v (1) m	9·6
26	3811	45	Bh	=m, n+5	9·6*b*
27	3812	,,	Br	l+1	9·1
27	3812	30	Co	m−1, n+3	9·8
27	3812	44	Wi	m−1	9·8
28	3813	40	D	m+1	9·6
Feb 1	3817	75	Bn	l (1) v (2) m	9·3
1	3817	60	Si	=m	9·7
1	3817	30	Co	l−2·5, m+0·5	9·5
4	3820	90	Bh	l−1, m+3	9·3
8	3824	22	Ni	=m	9·7
8	3824	30	Co	k−4, =l	9·2
8	3824	,,	D	l−1, m+3	9·3
11	3827	90	Bh	g (3) v (1) l	8·9
14	3830	30	D	l−1, m+4	9·3
16	3832	50	Bn	g (4) v (1) k	8·7

Sept. 12, Orange.
Sept. 16, Ma, Pinky red.
Sept. 30, Br, Reddish orange.
Oct. 12, Ma, Dull red.
Oct. 14, Pr, Old gold colour.
Oct. 21, Pale red.
Nov. 6, Dull red.

Dec. 23, Dull red.
Jan. 27, Br, Reddish.

(7609) T CEPHEI—*continued.*

1924					
Feb					
16	3832	30	Co	=k	8·8
18	3834	90	Bh	g (1) v (1) l	8·7
21	3837	,,	,,	g (1) v (1) l	8·7
22	3838	30	Co	=k	8·8*b*
23	3839	22	Ni	k (2) v (2) l	9·0
23	3839	90	Bh	g (1) v (1) l	8·7
24	3840	60	Si	=8	8·2
26	3842	50	Bn	f (4) v (1) g	8·1
28	3844	45	Bh	g (1) v (2) l	8·5
28	3844	30	Co	k+2	8·6
29	3845	22	Ni	=k	8·8
Mar					
1	3846	45	Bh	g (1) v (3) l	8·4
2	3847	30	D	g−5, k+3	8·6*b*
4	3849	50	Bn	f (3) v (1) g	8·1
4	3849	90	Bh	g−2	8·4
4	3849	30	Co	g−4, k+3	8·5
5	3850	22	Ni	h (5) v (2) k	8·6
6	3851	30	Co	k+3	8·5
8	3853	,,	D	g−1, k+5	8·3
8	3853	50	Bn	f (1) v (1) g	7·9
9	3854	44	Wi	=g	8·2
9	3854	30	Co	k+3	8·5
9	3854	...	Kw	g−2, l+4	8·6
10	3855	90	Bh	g+1	8·1
11	3856	30	D	g−2, k+5	8·3
11	3856	33	Wi	g+1	8·1
12	3857	22	Ni	h (2) v (4) k	8·3
13	3858	30	Co	=g	8·2
16	3861	,,	,,	=g	8·2
19	3864	50	Bn	f (1) v (4) g	7·8
22	3867	45	Bh	d (2) v (1) g, =f	7·7*b*
24	3869	30	Co	g+3	7·9*b*
24	3869	10	Wi	f−1, g+3	7·8
26	3871	45	Bh	d (2) v (1) f	7·4
28	3873	,,	,,	d (1) v (3) f	6·9*b*
28	3873	30	Co	f−3, g+3	7·9
29	3874	22	Ni	f (3) v (3) h	7·9
29	3874	50	Bn	e (3) v (1) f	7·5
30	3875	30	D	f−4, g+2	8·0
30	3875	10	Wi	f−1, g+3	7·8
Apr					
1	3877	,,	,,	f−2, 8+4	7·8
1	3877	30	Co	f−2	7·9
2	3878	22	Ni	f (3) v (3) h	7·9
2	3878	45	Bh	d (1) v (2) f	7·0
4	3880	30	Co	f−2	7·9
4	3880	50	Bn	e (1) v (3) f	7·3
5	3881	10	Wi	f−1, g+3	7·8*b*
7	3883	30	Co	=f	7·7
7	3883	,,	D	=f	7·7*b*
8	3884	90	Bh	d−2	6·9*b*
9	3885	30	Wi	f−2, g+3	7·9
9	3885	50	Bn	e (1) v (2) f	7·3
11	3887	30	D	e−5, f+1	7·6
14	3890	90	Bh	d−2	6·9
14	3890	30	Co	=f	7·7
20	3896	50	Bn	e (1) v (3) f	7·3
20	3896	45	Bh	d−2	6·9*b*
20	3896	30	Co	f+1	7·6
22	3898	60	Si	=f	7·7*b*
24	3900	90	Bh	d (2) v (3) f	7·1
25	3901	30	Co	f+2	7·5
26	3902	45	Bh	d−3	7·0
27	3903	10	Wi	d−8, f+1	7·5

Mar. 9, Kw, t.

1924					
Apr					
27	3903	B	Ni	f (2) v (1) h	8·
May					
1	3907	10	Wi	f+1	7·
4	3910	30	D	e−4, f+2	7·
5	3911	90	Bh	d−1	6·
5	3911	50	Bn	d (5) v (1) e	7·
5	3911	10	Wi	=f	7·
5	3911	B	Ni	e (4) v (1) f	7·
7	3913	30	D	e−2, f+3	7·
10	3916	90	Bh	d+1	6·
13	3919	60	Si	d (2) v (3) e	6·
13	3919	30	D	e−3, f+3	7·
13	3919	,,	Co	=e	7·
19	3925	50	Bn	d (2) v (1) e	7·
21	3927	30	D	d−2, e+3	6·
22	3928	45	Bh	d+3	6·
24	3930	B	Ni	=d	6·
25	3931	90	Bh	d+4	6·
25	3931	30	D	d−1, e+3	6·
26	3932	42	Si	=d	6·
27	3933	90	Bh	d+2	6·
27	3933	30	D	=d	6·
27	3933	50	Bn	d (1) v (3) e	6·
28	3934	30	Co	d+1	6·
June					
1	3938	,,	D	d+1	6·
4	3941	90	Bh	d+4	6·
5	3942	30	Co	d+3·5	6·
8	3945	B	Ni	c (9·5) v (1·5) d	6·
9	3946	,,	D	c−6, d+2	6·
11	3948	90	Bh	d+5	6·
12	3949	B	D	c−5, d+3	6·
13	3950	25	Bn	d+2·5	6·
13	3950	45	Bh	d+5	6·
14	3951	30	Co	d+5	6·
17	3954	B	D	c−4, d+4	6·
21	3958	,,	,,	c−5, d+3	6·
21	3958	30	Co	d+5	6·
23	3960	B	D	c−5, d+3	6·
23	3960	42	Si	=c	6·
23	3960	45	Bh	d+5	6·
26	3963	B	D	c−4, d+4	6·
27	3964	90	Bh	d+5	6·
30	3967	30	Co	d+6	6·
30	3967	45	Bh	d+5	6·
30	3967	B	D	c−3, d+5	6·
July					
2	3969	,,	,,	c−4, d+4	6·
2	3969	,,	Ni	c (6·5) v (4·5) d	6·
5	3972	,,	D	c−3, d+5	6·
9	3976	,,	,,	c−4, d+4	6·
9	3976	30	Co	d+4·5	6·
10	3977	B	Ni	c (7) v (2) d	6·
11	3978	,,	Bn	c−3, d+2	6·

May 13, D, 5^c.
May 21, 25, 27, June 1, D, 7^c.
June 1, With B, 6·6.
June 5, Orange.
June 11, 27, Yellow.
June 13, Bh, Yellow.
June 14, Orange red.
June 21, Co, Orange.
June 30, July 9, Co, Orange red.
July 5, 7^c.

(7609) T CEPHEI—*continued.*

1924					
July					
11	3978	90	Bh	d+6	6·1
13	3980	B	D	c−5, d+3	6·5
16	3983	30	Co	d+3	6·4
18	3985	50	Ma	d+2	6·5
19	3986	90	Bh	d+6	6·1
21	3988	50	Bn	d+3	6·4
22	3989	30	Co	=d	6·7
24	3991	90	Bh	d+2	6·5
26	3993	B	Ni	=d	6·7
29	3996	30	Co	d+2	6·5
29	3996	90	Bh	d−2	6·9
29	3996	50	Bn	d+2	6·5
31	3998	,,	Ma	d+4	6·3
31	3998	B	D	d+1	6·6
Aug.					
2	4000	30	Co	=d	6·7
3	4001	90	Bh	d−3	7·0
5	4003	50	Bn	d+1	6·6
8	4006	42	Si	d (2) v (3) e	6·9
8	4006	90	Bh	d−2	6·9
9	4007	B	D	d−3, e+2	7·0
12	4010	50	Bn	d−1	6·8
17	4015	30	Co	=e, f+4	7·2
17	4015	,,	D	d−3, e+2	7·0
19	4017	50	Bn	d (1) v (2) e	6·8
22	4020	90	Bh	d (2) v (1) f	7·4*b*
25	4023	30	Bn	d (3) v (1) e	7·0
27	4025	,,	D	e−5, f+2	7·6
27	4025	90	Bh	d (2) v (1) f	7·4*b*
31	4029	30	Bn	e (5) v (1) f	7·6
Sept					
2	4031	90	Bh	d−5	7·2
5	4034	60	Si	f (2) v (3) g	7·9
8	4037	30	Co	=f	7·7
9	4038	45	Bh	d (2) v (1) f	7·4
9	4038	50	Bn	f (2) v (1) g	8·0
12	4041	30	D	f−3, g+2	8·0
12	4041	,,	Co	=g	8·2
14	4043	,,	,,	f−4, =g	8·1
14	4043	22	Ni	h (4) v (4) k	8·5
16	4045	45	Bh	d (3) v (1) f	7·4
19	4048	30	D	g−1, k+5	8·3
22	4051	60	Si	=g	8·2
22	4051	50	Bn	f (3) v (1) g	8·1
23	4052	45	Bh	=g	8·2
27	4056	50	Bn	g (1) v (2) k	8·4
27	4056	45	Br	f−1	7·8

July 11, 19, Bh, Orange.
July 16, 29, Co, Orange.
July 18, Pale red.
Aug. 17, D, 6c.
Aug. 27, D, 7c.

1924					
Sept					
27	4056	90	Bh	g−2	8·4
29	4058	45	,,	g (1) v (1) l	8·7
Oct					
2	4061	50	Ma	h−1	8·2
3	4062	60	Si	=h	8·1*b*
8	4067	,,	Kw	h (1) v (4) l, h−3	8·4*b*
12	4071	50	Bn	g (1) v (2) k	8·4
14	4073	60	Si	h (3) v (2) k	8·5
22	4081	45	Bh	=l	9·2
23	4082	60	Si	=12	8·8
23	4082	50	Bn	k (1) v (2) l	8·9
24	4083	22	Ni	l (1) v (2) m	9·3
26	4085	45	Bh	=l	9·2
28	4087	60	Si	=l	9·2
Nov					
3	4093	,,	,,	l (2) v (3) n	9·5
3	4093	50	Bn	k (3) v (1) l	9·1
3	4093	90	Bh	l (1) v (2) m	9·3
4	4094	22	Ni	l (2) v (2) m	9·4
8	4098	30	D	k (3) v (2) m	9·3
10	4100	90	Bh	l (2) v (1) m	9·5*b*
16	4106	,,	,,	l (1) v (1) m	9·4
16	4106	50	Ma	m (3) v (1) 28, 24+1	10·2
17	4107	30	D	=m	9·7
19	4109	60	Si	=m	9·7
23	4113	22	Ni	m (2) v (1) n	10·0
27	4117	50	Bn	l (3) v (1) m	9·5
27	4117	90	Bh	m+1	9·6
30	4120	,,	,,	=m	9·7
30	4120	60	Si	m (2) v (3) 24	9·9
Dec					
2	4122	90	Bh	=m	9·7
5	4125	,,	,,	=m	9·7
5	4125	50	Bn	m (3) v (2) n	9·9
6	4126	22	Ni	m (3) v (1) n	10·0
6	4126	34	Li	l (8) v (2) m	9·6
7	4127	60	D	m−1, n+3	9·8*b*
14	4134	50	Bn	m (1) v (3) n	9·8
14	4134	90	Bh	m−1	9·8
19	4139	,,	,,	m (1) v (2) n	9·8
19	4139	60	Si	=n	10·1
22	4142	22	Ni	n−0·5	10·2
23	4143	40	D	n−1, 0+3	10·2
24	4144	90	Bh	m (1) v (1) n	9·9
26	4146	22	Ni	n−0·5	10·2
26	4146	60	Si	=n	10·1
28	4148	120	Bn	n−1, 0+3	10·2
29	4149	40	D	=n	10·1
30	4150	120	Bn	n (1) v (3) 0	10·2
31	4151	90	Bh	m (2) v (1) n	10·1

Oct. 8, T.

(806) o (MIRA) CETI.

H.D. *021403.*

Star B	= B.D. — 3°362	9^m·99,	**H.A., 29,** 144.
,, D	= ,, — 3°356	10·43,	,, **74,** 30.
,, K	= ,, — 3°340	7·34,	,, **54,** 27.
,, L	= ,, — 2°375 = Fl. 63 Ceti	5·99,	,, **44,** 13.
,, M	= ,, — 4°394	6·92,	,, **44,** 14.
,, N	= ,, — 3°336 = Fl. 66 Ceti	5·63,	,, **44,** 13.
,, P	= ,, — 1°285 = Fl. 61 ,,	5·87,	,, **44,** 13.
,, R	= ξ Piscium	4·78,	,, **44,** 12.
ν Ceti		5·02,	,, **50,** 33.
ρ ,,		4·90,	,, **50,** 32.
γ Eridani		3·19,	,, **50,** 42.
α Leporis		2·69,	,, **50,** 55.
β ,,		2·96,	,, **50,** 54.

Though identical with Hagen's 19, B.D.—3°356 was styled D in B.A.A. Memoir X 38. This designation is therefore retained, but the value 10^m·43, being that give Hagen's 19 in the H.P. column of Hagen's Catalogue, A.S.V. Series IV. (*vide* **H.A., 7** is here adopted. 9^m·4, previously used, was the B.D. value.

Date.	Julian Date.	Inst.	Observer.	Comparisons.	Deduced Mag.
1920 Jan					
1	2325	B	Ni	β (2) v (3) 7	8·3*b*
1	2325	,,	Bh	$\alpha-4$, $\beta+4$	7·7*b*
8	2332	45	,,	$\alpha-6$, $\beta+3$	7·8
8	2332	40	Hw	β (8) v (2) δ	8·7*b*
8	2332	50	Ma	$\delta+6$, $\epsilon+10$	8·2*b*
9	2333	22	Ni	β (7) v (1·5) 7	8·6
11	2335	,,	,,	β (7) v (1) 7	8·6
13	2337	50	Ma	$=\delta$	8·8
14	2338	22	Ni	$=7$	8·7
14	2338	30	D	$\beta-5$, $\gamma+1$	8·5
15	2339	45	Br	$\beta-4$, $\delta+4$	8·4
15	2339	,,	Bh	$\beta+1$	7·9
16	2340	40	Hw	$=\delta$	8·8
19	2343	,,	,,	$=\delta$	8·8
19	2343	30	Bn	γ (3) v (1) δ	8·8
19	2343	50	Ma	δ (2) v (3) B	9·3
21	2345	,,	,,	$=\delta$, $\epsilon+6$	8·7
21	2345	,,	Bn	$\delta+1$	8·7
22	2346	30	D	$\beta-5$, $\gamma+1$	8·5
22	2346	94	Ni	$7+2$	8·5
24	2348	50	Ma	$=\delta$, $\epsilon+5$	8·8
25	2349	45	Bh	$\delta+3$, $\epsilon+6$	8·6*b*
Feb					
3	2358	94	Ni	7 (1) v (2) ϵ	8·9
5	2360	,,	,,	$\epsilon+5$	8·7
5	2360	45	Bh	$=\delta$, $\epsilon+5$	8·8*b*
6	2361	40	Hw	δ (5) v (5) ϵ	9·0
6	2361	60	Ga	$\epsilon+2$	9·0

Jan. 13, About. Dull brick red.
Jan. 15, Br, With B, 8·6.
Jan. 19, Ma, Red.
Jan. 21, Ma, Dull red.
Jan. 22, Feb. 5, Ni, With 22, 8·9.
Feb. 6, Ga, t. Ni, With 22, 9·0.

Date.	Julian Date.	Inst.	Observer.	Comparisons.
1920 Feb				
6	2361	94	Ni	7 (4) v (3·5) ϵ
6	2361	30	D	$\delta-2$, $\epsilon+2$
7	2362	,,	,,	$\delta+2$, $\epsilon+4$
8	2363	94	Ni	7 (4) v (4) ϵ
8	2363	30	D	$\delta+1$, $\epsilon+3$
10	2365	45	Bh	$\beta-8$, $=\delta$, $\epsilon+4$
11	2366	,,	,,	$\epsilon+3$
11	2366	94	Ni	7 (5) v (2·5) ϵ
16	2371	45	Bh	$\epsilon+1$
17	2372	40	Hw	$=\epsilon$
17	2372	79	Ma	$\epsilon-1$
17	2372	94	Ni	7 (5) v (2) ϵ
19	2374	,,	,,	7 (5) v (1) ϵ
21	2376	45	Bh	$=\epsilon$
21	2376	79	Ma	$\epsilon-1$
22	2377	60	D	$\delta-2$, $\epsilon+2$
22	2377	94	Ni	7 (6) v (1·5) ϵ
23	2378	90	Bh	$=\epsilon$
24	2379	40	Hw	$=\epsilon$
24	2379	94	Ni	$\epsilon+1$
26	2381	90	Bh	$\epsilon-2$
29	2384	45	Br	$=\epsilon$
Mar				
1	2385	94	Ni	$=\epsilon$
3	2387	90	Bh	$\epsilon-2$
4	2388	94	Ni	$=\epsilon$
7	2391	90	Bh	$\epsilon-2$
12	2396	90	Bh	$\epsilon-3$
July				
6	2512	NE	My	g (2) v (5) k
10	2516	B	Bh	$g-3$

Feb. 8, Ni, With 22, 9·1.
Feb. 11, Ni, With 22, 9·1.
Feb. 17, Ma, Very difficult. Ni, With 22

(806) *o* (MIRA) CETI—*continued.*

1920 July					
2	2518	NE	My	g (5) v (2) k	3·3
5	2521	B	Bh	g−5, k+5	3·1
5	2521	NE	D	k+4	3·2*c*
6	2522	B	Ni	=k	3·6
8	2524	NE	My	g (5) v (2) k	3·3
9	2525	B	Bh	g (2) v (1) k, g−6, k+3	3·3
1	2527	NE	My	k (1) v (2) l	3·7
4	2530	B	Ni	g (10) v (2) k	3·4
7	2533	,,	,,	g (8) v (3) k	3·3
7	2533	NE	My	l−1	3·9
0	2536	B	Bh	g (1) v (3) k, g−2, k+8	2·9
Aug. 1	2538	,,	Ni	g (8) v (2) k	3·4
2	2539	NE	My	l−4	4·2*b*
3	2540	B	Ni	g (10) v (1) k	3·5
6	2543	,,	Bh	g−3, k+6	3·0
0	2547	NE	My	m+1	4·0
3	2550	B	Bh	g (2) v (1) k	3·3
6	2553	NE	My	m−1	4·2
8	2555	B	Bh	=k	3·6
0	2557	NE	My	m−3	4·4
2	2559	B	Bn	k (4) v (1) m	4·0*b*
4	2561	,,	D	m (1) v (4) r, m−2	4·3*b*
5	2562	NE	My	m−5	4·6
6	2563	B	Bn	m (2) v (1) R	4·6
8	2565	,,	,,	R−1	4·9*b*
9	2566	F	Bh	=m, =n, s+10, N+15	4·3
9	2566	B	Ni	q (3) v (2) r	5·0
Sept. 1	2569	NE	My	t+3	5·2*b*
4	2572	F	Bh	s+5, N+10	4·8
4	2572	B	Cn	t+9	4·6
6	2574	,,	Ni	r (5) v (1·5) t	5·4
6	2574	,,	Ma	N+6·5	5·0
7	2575	,,	My	=t	5·5*b*
7	2575	,,	Bn	R (2) v (1) s	5·2
8	2576	,,	Ni	t+1	5·4
8	2576	,,	D	r−2, s+1	5·3
9	2577	,,	,,	r−4, s+1, t+2	5·4
0	2578	F	Bh	N+5	5·1
0	2578	B	D	r−3, s+1	5·3
0	2578	,,	Ni	=t	5·5
1	2579	,,	,,	t (1) v (1) N	5·6
1	2579	,,	D	r−5, =s	5·5
2	2580	,,	Bn	R (5) v (1) s	5·3
3	2581	F	Bh	=s, N+5	5·3*b*
5	2583	B	My	t−3	5·8*b*
6	2584	F	Bh	s+3, N+5	5·1*b*
6	2584	B	Ni	t (1) v (2) N	5·6
7	2585	,,	D	=x, y+3	6·1*b*
8	2586	,,	Ma	N (1) v (1) L, M+8	5·9
8	2586	,,	My	t−5	6·0
8	2586	,,	Ni	N (3) v (2) L	5·8
9	2587	,,	D	x−2, y+1	6·3
9	2587	,,	Br	x−1, y+1	6·2
0	2588	,,	Ni	N (4) v (2) L	5·9
2	2590	F	Bh	=N, P+3	5·6
4	2592	B	My	y−2	6·6*b*
5	2593	F	Bh	N (1) v (1) z, =w, =x	6·1
8	2596	22	Ni	N (2) v (4) L	5·8
0	2598	B	My	y−5	6·9*b*
Oct. 1	2599	45	Bh	y+2	6·2
Oct. 2	2600	F	Bh	N (2) v (1) z, y+1	6·3
3	2601	B	D	y (3) v (1) *a*, *a*+4	7·0*b*
4	2602	22	Ni	L (2·5) v (1) y	6·3
5	2603	,,	,,	y (2) v (4) z	6·5*b*
5	2603	B	D	z−4, *a*+1	7·1
6	2604	,,	Br	*a*+1	7·2
6	2604	F	Bh	=y	6·4
6	2604	B	Cn	z−7, *a*+5	7·1
7	2605	22	Ni	y (1) v (1) z	6·5
8	2606	,,	,,	y−2, =z	6·6
8	2606	B	Cn	z−7, *a*+3	7·2
8	2606	30	D	y (4) v (1) *a*, *a*+2	7·1
9	2607	B	Ma	z−2·5, *a*+2	7·0
10	2608	,,	Cn	*a*−3	7·6
10	2608	22	Ni	z (3) v (3) M	6·8
11	2609	30	D	y (4) v (1) *a*	7·1
12	2610	22	Ni	z (6) v (1) M	6·9
12	2610	45	Bh	y−2, *β*+15	6·5
13	2611	30	Bn	z (4) v (1) *a*	7·2
14	2612	22	Ni	M (3) v (2) *a*	7·1
18	2616	45	Bh	y−5, *β*+10	6·9*b*
18	2616	30	D	*a*+1, *β*+5	7·4
18	2616	22	Ni	M (3) v (2) *a*	7·1
19	2617	,,	,,	M (4) v (2) *a*	7·2
21	2619	,,	,,	*a* (2) v (4) *β*	7·5
22	2620	,,	,,	*a* (4) v (3) *β*	7·7
22	2620	45	Bh	*β*+15	6·5*b*
24	2622	22	Ni	*a* (4) v (3) *β*	7·7
26	2624	,,	,,	*a* (3·5) v (4) *β*	7·6
28	2626	,,	,,	*a* (3) v (3) *β*	7·7
29	2627	B	Cn	=*β*	8·0
29	2627	45	Bh	*β*+15	6·5
30	2628	22	Ni	*a* (6) v (1·5) *β*	7·9
31	2629	B	Cn	*β*+5	7·5*c*
Nov. 1	2630	22	Ni	*a* (5) v (1·5) *β*	7·9
1	2630	30	D	*a*−7, *β*+1·5	7·9*b*
1	2630	,,	Bn	*a* (2) v (1) *β*	7·8
3	2632	22	Ni	*β* (1) v (7) 7	8·1
3	2632	25	Cn	*β*−5	8·5
3	2632	45	Bh	*β*+10	7·0
4	2633	30	Bn	*a* (2) v (1) *β*	7·8
6	2635	50	Ma	*δ*+6	8·2
6	2635	25	Cn	=*β*	8·0
8	2637	22	Ni	*β* (3) v (4) 7	8·3
10	2639	45	Bh	*β*+6	7·4
11	2640	B	Br	*β*−3, *γ*+3	8·3
11	2640	50	Ma	*δ*+5, *ε*+10	8·3
13	2642	45	Bh	*β*+3, *ε*+15	7·7
13	2642	40	Hw	*β* (7) v (3) *δ*	8·6*b*
14	2643	25	Cn	*β*−6	8·6
15	2644	,,	,,	*β*−7	8·7
16	2645	50	Ma	*δ*+6	8·2
16	2645	22	Ni	*β* (6) v (2) 7	8·5
18	2647	,,	,,	*β* (7) v (1·5) 7	8·6
18	2647	50	Ma	*δ*+2	8·6
18	2647	30	D	*β*−3, *γ*+3, *δ*+6	8·3
19	2648	22	Ni	*β* (7) v (1) 7	8·6
20	2649	45	Bh	=*β*	8·0
20	2649	40	Hw	*β* (5) v (5) *δ*	8·4*b*

Oct. 3, With B, 7·1*b*.
Oct. 9, With 50, Pale red.
Oct. 11, With B, 7·3.
Nov. 6, Ma, Pale red.
Nov. 11, Ma, Red.
Nov. 16, Ma, Very red.

(806) o (MIRA) CETI—*continued.*

1920 Nov 21	2650	22	Ni	β (5) v (1) 7	8·6
23	2652	94	,,	β (4) v (5) 7	8·3
28	2657	45	Bh	=β	8·0*b*
28	2657	25	Cn	β−3	8·3
Dec 1	2660	22	Ni	=7	8·7
6	2665	45	Bh	β (1) v (3) ε	8·3
8	2667	,,	Br	β−4, δ+4	8·4
10	2669	50	Ma	δ (1) v (3) ε	8·9*c*
10	2669	45	Bh	β (1) v (2) ε	8·4*b*
11	2670	,,	,,	β−8, ε+4	8·8
14	2673	25	Cn	β−9	8·9
17	2676	90	Bh	ε+5	8·7
21	2680	,,	,,	ε+5	8·7
25	2684	,,	,,	ε+3	8·9
27	2686	94	Ni	7 (3) v (3) ε	8·9
28	2687	40	Hw	δ (5) v (5) ε	9·0
28	2687	90	Bh	ε+5	8·7
31	2690	,,	,,	ε+3	8·9
31	2690	45	Br	δ+1	8·7
1921 Jan 2	2692	79	Ma	ε+1·5	9·0
2	2692	90	Bh	ε+2	9·0*b*
6	2696	,,	,,	ε+2	9·0
7	2697	32	Ca	ε−1	9·3
7	2697	50	Ma	ε+2	9·0
8	2698	B	Cn	β−9, =δ	8·9
12	2702	50	Ma	ε−1	9·3
12	2702	75	Bn	ε−1·5	9·3*b*
13	2703	45	Bh	ε−1	9·3
15	2705	75	Bn	ε−1	9·3
15	2705	40	Hw	=δ	8·8*b*
16	2706	60	D	ε−2	9·4*b*
16	2706	94	Ni	7 (5) v (0·5) ε	9·1
21	2711	45	Bh	ε−2	9·4
26	2716	32	Ca	ε−3	9·5
30	2720	94	Ni	7 (5) v (0·5) ε	9·1
30	2720	60	D	ε−3, 14+2	9·4*b*
30	2720	90	Bh	ε−3, δ−6	9·5
Feb 1	2722	75	Bn	ε−1	9·3
2	2723	90	Bh	ε−3	9·5
2	2723	40	Hw	δ (6) ε (4) v	9·4
4	2725	32	Ca	ε−2	9·4
6	2727	25	Cn	β−10	9·0*c*
9	2730	90	Bh	ε−2	9·4
10	2731	...	Ma	ε−1	9·3
12	2733	94	Ni	7 (3) v (2) ε	9·0
14	2735	,,	,,	7 (4) v (1) ε	9·1
14	2735	90	Bh	ε−2	9·4
16	2737	,,	,,	=ε	9·2
19	2740	94	Ni	7 (4) v (2) ε	9·0
20	2741	75	Bn	ε−1	9·3
20	2741	90	Bh	=ε	9·2
21	2742	,,	,,	ε+2	9·0
22	2743	40	Hw	=ε	9·2*b*
22	2743	94	Ni	7 (4) v (1·25) ε	9·1
23	2744	,,	,,	7 (4) v (2) ε	9·0
23	2744	32	Ca	ε−1	9·3

Dec. 10, Ma, Difficult.
Dec. 27, With 22, 9·0*b*.
Jan. 16, 30, D, Difficult.
Jan. 30, Ni, With 22, 9·5.
Feb. 12, With 22, 9·2.
Feb. 23, 26, Ni, With 22, 9·1.

1921 Feb 24	2745	40	Hw	=ε	
25	2746	90	Bh	β−8, ε+4	
25	2746	25	Cn	=ε	
26	2747	94	Ni	7 (3) v (3) ε	
Mar 1	2750	40	Hw	=ε	
2	2751	90	Bh	β−8, ε+4	
3	2752	94	Ni	7 (5) v (1·5) ε	
7	2756	90	Bh	ε+5	
10	2759	45	,,	ε+5	
10	2759	40	Hw	=ε	
11	2760	94	Ni	7 (3) v (1) ε	
18	2767	45	Bh	β−3, ε+6	
June 12	2853	B	Ca	m−1, n+1	
July 4	2875	45	Bh	=m	
13	2884	B	Ni	r (2) v (3) t	
18	2889	45	Bh	m−3	
26	2897	F	,,	=q	
29	2900	45	,,	m−5, t+5	
30	2901	B	D	<r	
Aug 1	2903	,,	Ca	=s	
3	2905	,,	D	t−1, u+1	
8	2910	,,	,,	u−3, x+1	
8	2910	,,	Bn	s−1	
13	2915	,,	Ni	=L	
14	2916	22	,,	N (3) v (3) L	
16	2918	45	Bh	=s, =t	
18	2920	22	Ni	L (3) v (4) y	
19	2921	45	Bh	R−10, N+1	
26	2928	22	Ni	L (5) v (2) y	
26	2928	B	D	z−3, α+4	
27	2929	,,	,,	z−4, α+2	
28	2930	22	Ni	L (5) v (2) y	
30	2932	,,	,,	=y	
30	2932	B	Bn	z (1) v (1) α	
30	2932	,,	D	z−4, α+0·5	
31	2933	,,	,,	=α	
31	2933	45	Bh	N−6, r−10	
Sept 1	2934	22	Ni	z (5) v (2) M	
4	2937	32	Ca	z−3, α+3	
5	2938	B	Bn	z (5) v (1) α	
5	2938	45	Bh	y−6	
5	2938	22	Ni	z (6) v (1) M	
6	2939	30	D	y (3) v (1) α, α+3	
7	2940	,,	Bn	α+1	
8	2941	,,	D	y−7, α+2	
10	2943	45	Bh	y−8, β+10	
10	2943	,,	Br	=α	
14	2947	30	D	α−2, β+5	
17	2950	22	Ni	α (2) v (4) β	
21	2954	45	Bh	β+10	
22	2955	12	Cn	=α, 3+2, β+7	
22	2955	30	D	α−4, β+3	
24	2957	22	Ni	α (4) v (2) β	
25	2958	,,	,,	α (7) v (1·5) β	
25	2958	45	Bh	β+10	
25	2958	B	Br	α−4, β+4	

July 13, Very uncertain.
Aug. 14, With B, 6·2.
Aug. 30, D, Difficult.
Sept. 6, With B, 7·2.
Sept. 10, Br, About. Difficult.

(806) *o* (MIRA) CETI—*continued.*

921					
ept					
25	2958	12	Cn	$\alpha-6$, $3-2$, $=\beta$	8·0
27	2960	50	Bn	α (2) v (1) β	7·8
28	2961	30	D	$\alpha-5$, $\beta+3$	7·8
28	2961	32	Ca	$\alpha-6$, $\beta+1$	7·9
28	2961	12	Cn	$\alpha-5$, $=3$, $\beta+5$	7·7
28	2961	22	Ni	$=\beta$	8·0
29	2962	,,	,,	β (1) v (5) 7	8·1
30	2963	45	Bh	$\beta+8$	7·2
30	2963	30	D	$\beta+1$	7·9
ct					
1	2964	22	Ni	β (2) v (5) 7	8·2
3	2966	12	Cn	$3-7$, $=\beta$	8·3
4	2967	50	Bn	β (1) v (4) γ	8·1
5	2968	45	Bh	$\beta+6$	7·4
5	2968	12	Cn	$3-7$, $\beta-1$	8·3
5	2968	30	D	$=\beta$	8·0
5	2968	22	Ni	β (5) v (3) 7	8·4
7	2970	32	Ca	$\beta-3$, $\gamma+3$	8·3
8	2971	12	Cn	$3-8$, $\beta-1$	8·4
9	2972	22	Ni	β (6) v (3) 7	8·5
10	2973	45	Bh	$\beta+3$	7·7
15	2978	,,	,,	$\beta+2$	7·8
17	2980	,,	,,	$\beta+1$	7·9
18	2981	22	Ni	β (5) v (2·5) 7	8·5
22	2985	12	Cn	$7+5$, $8+3$	8·3*b*
23	2986	,,	,,	$=7$, $8+3$, $\delta+6$	8·4*b*
23	2986	45	Bh	$\beta+1$	7·9
24	2987	22	Ni	β (8) v (1) 7	8·6
25	2988	12	Cn	$=7$, $8+4$, $\delta+5$	8·4*b*
27	2990	90	Bh	$\beta+3$	7·7
28	2991	50	Ma	$\epsilon+8$	8·4
30	2993	12	Cn	$7-2$, $8+3$, $\delta+5$	8·5*b*
30	2993	32	Ca	$=\delta$	8·8
31	2994	90	Bh	$\beta-1$	8·1
ov					
2	2996	22	Ni	7 (4) v (2) ϵ	9·0
6	3000	45	Br	$\beta-6$, $\delta+3$	8·6
7	3001	50	Bn	δ (1) v (3) ϵ	8·9
7	3001	90	Bh	$\beta-1$, $\epsilon+10$	8·2
7	3001	50	Ma	$\delta+2$, $\epsilon+7$	8·6
8	3002	22	Ni	7 (4) v (1·5) ϵ	9·1
10	3004	,,	,,	7 (4) v (1) ϵ	9·1
12	3006	45	Bh	$\beta-4$	8·4
20	3014	90	,,	$\beta-5$, $\epsilon+5$	8·6
21	3015	32	Ca	$\delta-3$, $\epsilon+1$	9·1
22	3016	22	Ni	7 (5) v (1) ϵ	9·1
23	3017	90	Bh	$\beta-10$, $=\epsilon$	9·1
23	3017	50	Ma	$\epsilon-2$	9·4*b*
23	3017	40	Hw	$=\epsilon$	9·2
24	3018	60	D	$=\epsilon$	9·2*b*
24	3018	94	Ni	7 (6) v (2) ϵ	9·1
25	3019	45	Bh	$=\epsilon$	9·2
26	3020	94	Ni	7 (6) v (1·5) ϵ	9·1
27	3021	75	Bn	$\epsilon-1$	9·3
27	3021	12	Cn	$=\delta$, $7-8$	9·2*b*
29	3023	90	Bh	$\epsilon-1$	9·3
30	3024	94	Ni	7 (6) v (0·5) ϵ	9·2
ec					
2	3026	,,	,,	$=\epsilon$	9·2
3	3027	90	Bh	$\epsilon-1$	9·3
4	3028	60	D	$\epsilon+1·5$	9·0
4	3028	94	Ni	$\epsilon+0·5$	9·1

1921					
Dec					
15	3039	90	Bh	$\epsilon-3$	9·5
17	3041	40	Hw	$=\epsilon$	9·2*b*
18	3042	60	D	$\epsilon-2$	9·4*b*
20	3044	90	Bh	$\epsilon-3$	9·5
22	3046	75	Bn	$\epsilon-1·5$	9·3
23	3047	160	Br	$\epsilon-3$	9·5
24	3048	94	Ni	$\epsilon-2$	9·4
25	3049	90	Bh	$\epsilon-4$	9·6
26	3050	94	Ni	$\epsilon-1$	9·3
28	3052	,,	,,	$\epsilon-1$	9·3
28	3052	75	Bn	ϵ (1) v (1) D	9·8
29	3053	94	Ni	$\epsilon-1·5$	9·3
29	3053	90	Bh	$\epsilon-4$	9·6
29	3053	12	Cn	$\epsilon-4$	9·6*c*
31	3055	,,	,,	$\epsilon-4$, $=11$	9·5*c*
1922					
Jan					
1	3056	,,	,,	$\epsilon-5$, $11-2$, $15-3$	9·8*b*
3	3058	120	Br	$\epsilon-2$	9·4
3	3058	75	Bn	ϵ (1) v (2) 19	9·6
3	3058	90	Bh	$\epsilon-3$	9·5
6	3061	94	Ni	$\epsilon-2$	9·4
8	3063	90	Bh	$\epsilon-3$	9·5
10	3065	,,	,,	$\epsilon-3$	9·5
10	3065	50	Ma	$\epsilon-2$	9·4
14	3069	94	Ni	$=\epsilon$	9·2
16	3071	40	Hw	$=\epsilon$	9·2
16	3071	79	Ma	$\epsilon-6$	9·8*b*
18	3073	90	Bh	$\epsilon-1$	9·3
20	3075	,,	,,	$\epsilon+1$	9·1
20	3075	40	Hw	$=\epsilon$	9·2
23	3078	60	D	$\epsilon-2$	9·4*b*
23	3078	94	Ni	$\epsilon+1$	9·1
28	3083	22	,,	$\epsilon+1$	9·1
28	3083	90	Bh	$\epsilon+1$	9·1
Feb					
1	3087	40	Hw	$=\epsilon$	9·2
2	3088	90	Bh	$\epsilon+3$	8·9
4	3090	94	Ni	7 (4) v (2) ϵ	9·0
5	3091	45	Bh	$\epsilon+3$	8·9
8	3094	,,	,,	$\epsilon+5$	8·7
8	3094	94	Ni	7 (3) v (3) ϵ	8·9
10	3096	50	Bn	$\epsilon+1$	9·1*b*
10	3096	94	Ni	7 (1) v (4) ϵ	8·8
11	3097	,,	,,	7 (3) v (3) ϵ	8·9*b*
11	3097	45	Bh	$\beta-5$, $\epsilon+6$	8·6
12	3098	94	Ni	$=7$	8·7
12	3098	60	D	$=\delta$, $\epsilon+5$	8·8*b*
13	3099	40	Hw	$=\epsilon$	9·2*b*
14	3100	22	Ni	7 (2) v (3) ϵ	8·9
20	3106	45	Bh	$\beta+1$	7·9
21	3107	32	Ca	$\beta-5$, $\gamma+1$	8·5
23	3109	45	Br	$=\beta$	8·0
25	3111	22	Ni	β (5) v (1) 7	8·6
27	3113	,,	,,	β (4) v (1) 7	8·5
28	3114	45	Bh	$\beta+10$	7·0
Mar					
4	3118	,,	,,	$y-2$, $z+2$, $\beta+13$	6·6
4	3118	40	Hw	$=\beta$	8·0
13	3127	22	Ni	$=y$	6·4*b*
14	3128	32	Ca	$z-2$, $\alpha+4$	6·9*b*
16	3130	45	Bh	$=t$, $y+5$	5·7*b*

Oct. 28, Pale red.
Nov. 7, Ma, Dull red.
Nov. 24, D, Difficult. Ni, With 22, 9·2.
Nov. 26, 30, Dec. 4, Ni, With 22, 9·3.

Dec. 24, 29, Ni, With 22, 9·5.
Jan. 23, Ni, With 22, 9·3.
Feb. 12, Ni, With 22, 8·9.
Mar. 13, Approximately.

(806) *o* (MIRA) CETI—*continued.*

1922					
July					
3	3239	B	Ca	s−1, =t	5·5
Aug					
5	3272	45	Bh	y−2, z+2	6·5
7	3274	22	Ni	z (3) v (4) M	6·8
12	3279	45	Bh	=z, a+5	6·7
15	3282	30	D	y (5) v (1) a, a+2	7·1*b*
15	3282	,,	Bn	a (1) v (3) β	7·5
15	3282	22	Ni	M (4) v (1) a	7·2
16	3283	,,	,,	M (0·5) v (2·5) a	7·0
19	3286	45	Bh	y−6, z−3	7·0*b*
20	3287	22	Ni	M (2) v (4) a	7·0
23	3290	,,	,,	a (4) v (2) β	7·8
25	3292	45	Bh	=a, β+7	7·3
25	3292	22	Ni	a (6) b (1·5) β	7·9
27	3294	,,	,,	a (4) v (1) β	7·9
29	3296	,,	,,	a (6) v (1) β	7·9
30	3297	B	Ca	a (4) v (3) β	7·7
31	3298	45	Bh	a−4, β+4	7·7
Sept					
3	3301	22	Ni	=β	8·0*b*
5	3303	,,	,,	β (1·5) v (5) 7	8·2
7	3305	30	Bn	a (3) v (2) β	7·7
9	3307	45	Bh	β+3	7·7
10	3308	22	Ni	β+1	7·9
12	3310	,,	,,	β (2·5) v (5) 7	8·2
13	3311	,,	,,	β (5) v (2·5) 7	8·5
13	3311	32	Ca	β (2) v (3) γ	8·2
15	3313	45	Bh	=β	8·0*b*
15	3313	B	Cn	=β	8·0*b*
16	3314	,,	,,	β−2	8·2
17	3315	22	Ni	β (7) v (1·5) 7	8·6
20	3318	50	Bn	β (1) v (3) γ	8·2
21	3319	B	Cn	3−6, β−5	8·5
22	3320	45	Bh	β+2	7·8
26	3324	,,	,,	β+1	7·9*b*
28	3326	31	D	β−5, δ+4	8·5*b*
29	3327	45	Br	β+2	7·8*b*
Oct					
6	3334	22	Ni	β (3) v (3) 7	8·4*b*
7	3335	45	Bh	β+1	7·9
11	3339	,,	,,	=β	8·0
12	3340	32	Ca	β (4) v (1) γ	8·5
12	3340	B	Cn	β−5, δ+3	8·5
13	3341	45	Bh	=β	8·0
13	3341	31	D	β−5, δ+3	8·5
13	3341	22	Ni	β (7·5) v (1·5) 7	8·6
14	3342	45	Br	=β	8·0
14	3342	50	Bn	β (4) v (1) γ	8·5
14	3342	70	Gr	β−2	8·2
15	3343	22	Ni	=7	8·7
17	3345	B	Cn	β−7, δ+4	8·6
18	3346	22	Ni	7 (1) v (3) ε	8·8
18	3346	45	Bh	=β	8·0
21	3349	B	Cn	β−5, δ+2	8·6
21	3349	94	Ni	7+4	8·3
22	3350	,,	,,	7+3, ε+6	8·5*b*
23	3351	30	Bn	γ (1) v (1) δ	8·7
23	3351	32	Ca	β−5, =γ	8·6
24	3352	22	Ni	7 (3) v (1·5) ε	9·0
25	3353	94	,,	7+2·5	8·4*b*
25	3353	45	Bh	β−4, ε+8	8·4

Sept. 3, Approximately.
Oct. 21, Ni, With 22, 8·8.
Oct. 22, With 22, 8·9.
Oct. 25, Ni, With 22, 9·0.

1922					
Oct					
26	3354	22	Ni	7 (2) v (2) ε	
26	3354	B	Cn	β−7, δ+1	
27	3355	22	Ni	7 (1) v (3) ε	
27	3355	45	Bh	β−5, ε+6	
28	3356	30	Bn	=γ	
Nov					
4	3363	45	Bh	β−8, ε+4	
8	3367	70	Gr	=β	
9	3368	94	Ni	7+4, ε+6	
11	3370	22	,,	=7	
11	3370	90	Bh	ε+5	
11	3370	45	Br	=β	
12	3371	B	Cn	β−5, δ+4	
15	3374	22	Ni	β (7·5) v (1·5) 7	
15	3374	30	Co	β−4	
15	3374	,,	Bn	β (2) v (1) γ	
16	3375	40	Hw	=β	
17	3376	32	Ca	β (5) v (1) γ	
17	3376	70	Gr	β−2	
18	3377	37	Lp	=δ	
19	3378	90	Bh	ε+5	
21	3380	45	,,	β−8, ε+4	
23	3382	50	Ma	ε+8	
24	3383	30	Bn	β (2) v (1) γ	
24	3383	45	Bh	β−6, ε+5	
26	3385	22	Ni	β (7) v (1) 7	
26	3385	40	Hw	a (5) v (5) β	
27	3386	32	Ca	β (4) v (1) γ	
28	3387	45	Bh	β−4, ε+8	
Dec					
6	3395	,,	,,	β−2	
6	3395	50	Ma	δ+7, ε+12	
7	3396	32	Ca	β (4) v (2) γ	
8	3397	22	Ni	β (6) v (3) 7	
8	3397	30	Co	=β	
8	3397	B	Cn	β−4, δ+4	
11	3400	45	Bh	β+1	
12	3401	B	Cn	3−6, β+1	
14	3403	22	Ni	β (5·5) v (3·5) 7	
16	3405	B	Ma	β−2	
16	3405	45	Bh	β+1	
17	3406	,,	,,	=β	
17	3406	22	Ni	β (5) v (4) 7	
18	3407	32	Ca	=β, γ+1	
19	3408	45	Br	a−5, β+2·5	
19	3408	22	Ni	β (6) v (4) 7	
20	3409	,,	,,	β (6) v (3) 7	
20	3409	51	Ma	ε+11	
20	3409	37	Lp	β (1) v (2) δ	
20	3409	30	Bn	a (3) v (1) β	
20	3409	26	Bg	a−6, β+1	
21	3410	22	Ni	β (4) v (3) 7	
22	3411	30	Co	=β	
23	3412	,,	Bn	a (2) v (1) β	
24	3413	,,	Co	β+2	
24	3413	B	Cn	3−7, β+7	
25	3414	45	Bh	β+5, ε+1·5	
26	3415	31	D	a−5, β+1·5	
26	3415	22	Ni	β (2) v (3) 7	

Nov. 9, With 22, 8·7.
Nov. 15, Co, Dull orange-red.
Nov. 18, Very ruddy.
Nov. 23, Pale red.
Dec. 8, Co, Orange-red.
Dec. 20, Lp, Very ruddy. Ma, Reddish.
Dec. 24, Co, Red.

(806) o (MIRA) CETI—*continued.*

1922 Dec.					
28	3417	45	Bh	β+7, ε+20	7·3*b*
30	3419	22	Ni	β+0·5	8·0
30	3419	32	Ca	α (4) v (3) β	7·7
1923 Jan.					
3	3423	75	Bn	α (1) v (2) β	7·5
4	3424	45	Bh	=α, β+8	7·3
4	3424	...	Ma	δ+15	7·3*b*
6	3426	22	Ni	β+1·5	7·9
6	3426	B	Cn	α−5, β+5	7·7*b*
6	3426	45	Bh	β+10	7·0
8	3428	,,	,,	y−5, z−2, α+3	6·9
8	3428	30	Bn	α−1, β+4	7·5
8	3428	,,	Co	β+3	7·7
9	3429	22	Ni	α (4) v (2·5) β	7·7
9	3429	B	Cn	α−5, β+8	7·5
9	3429	50	Ma	δ+7·5, ε+15	7·9
10	3430	30	Co	=α	7·3
11	3431	,,	Bn	α+1	7·2
11	3431	B	Ma	α+1·5	7·1
11	3431	45	Bh	=x, =y	6·2
12	3432	37	Lp	y (4) v (1) α, α+2	7·1*b*
14	3434	22	Ni	z (6) v (1) M	6·9
14	3434	45	Bh	β+15	6·5*b*
15	3435	B	Bn	z (6) v (1) α	7·2
16	3436	22	Ni	z (4) v (3) M	6·8
16	3436	40	Hw	y (5) v (5) α	6·8
17	3437	B	Ca	z (1) v (5) α	6·8
18	3438	,,	Ma	y (1) v (2) M	6·5*b*
20	3440	37	Lp	=y	6·4
20	3440	B	Ma	y+2	6·2
20	3440	F	Wf	y−1, z+2	6·5
20	3440	45	Bh	α+15, β+20, γ+10	6·5
20	3440	B	Ni	y (1) v (3) z	6·4
20	3440	,,	Cn	N−6, u−6, L−3, y+1, z+5	6·2
21	3441	,,	,,	N−7, y+2, z+6	6·2
22	3442	,,	,,	N−5, L+2, y+4	6·0
23	3443	,,	,,	N−4, L+2, z+7	5·9
23	3443	,,	Ni	N (3) v (1) L	5·9
23	3443	,,	Bn	w (1) v (4) y	5·9
24	3444	,,	Cn	N−2, t−4	5·9
27	3447	45	Bh	t+3	5·2
27	3447	B	Ca	q (1) v (1) r	5·0
29	3449	NE	,,	o−2, =p	4·6
30	3450	B	Bh	=q, =r	5·0*b*
31	3451	NE	Ca	n−1, =o	4·4
31	3451	,,	Cn	m−2, n+1, o+2	4·2
Feb.					
2	3453	,,	Ca	m (1) v (1) n	4·2
3	3454	,,	,,	l (2) v (1) m	4·0
3	3454	B	Bh	t+10, N+10	4·6*b*
3	3454	NE	Cn	k−4, l−3, m+1, n+3, o+4	4·0
4	3455	,,	,,	k−3, =l, =m	3·9
4	3455	,,	Lp	=m	4·1
4	3455	,,	Ca	l (1) v (2) m	3·9
4	3455	B	Bn	m+1	4·0

Jan. 4, Ma, Pale red. Difficult.
Jan. 8, 10, Co, 8c.
Jan. 9, Ma, Pale red.
Jan. 11, Bn, With B, 7·2.
Jan. 16, Ni, With B, 7·0.
Jan. 20, Lp, Very ruddy. Ma, With 50, Very pale pink.

1923 Feb.					
5	3456	NE	Co	=l, m+2·5	3·9*b*
5	3456	B	Br	l−2, m+1	4·0
6	3457	NE	Cn	k−2, =l, m+2	3·8
6	3457	B	Ni	k (6) v (1) m	4·0
6	3457	,,	D	=o	4·4
6	3457	,,	Bh	=m	4·1*b*
7	3458	,,	Br	l−1·5, m+1·5	4·0*b*
7	3458	NE	Wf	k−3, =l, m+1	3·9
8	3459	,,	Cn	k−1, l+2, m+3	3·7
8	3459	B	Bh	k (1) v (1) m	3·8*b*
8	3459	NE	Ma	l−1	3·9*b*
8	3459	B	Hw	=m	4·1
8	3459	,,	Br	=l	3·8
8	3459	NE	Ca	k−3, =l	3·8
9	3460	B	Ni	m+0·5	4·1
9	3460	NE	Cn	k−1, m+2	3·8
10	3461	,,	,,	k−1, l+1, m+4	3·7
10	3461	,,	Ca	k (2) v (1) l	3·7
11	3462	,,	,,	=k, l+3	3·5
11	3462	,,	Cn	=k, l+3	3·5
11	3462	,,	Co	k+2	3·4
11	3462	,,	Lp	=k	3·6
13	3464	B	Ni	k (2) v (3) m	3·7
13	3464	NE	Ca	h (5) v (1) k	3·5
16	3467	,,	,,	h (3) v (3) k	3·3
16	3467	B	Bh	k (1) v (1) m	3·8*b*
16	3467	NE	Cn	=k	3·6
17	3468	B	Ni	k+2	3·4
17	3468	NE	Cn	k+2	3·4
18	3469	,,	,,	=k	3·6*b*
18	3469	,,	Lp	g (2) v (1) k	3·3*b*
18	3469	,,	Ca	h (3) v (3) k	3·3
19	3470	,,	,,	h (3) v (4) k	3·2
20	3471	,,	Cn	g−5, k+2	3·3
21	3472	B	Bn	k+1	3·5
21	3472	NE	Ma	k+1·5	3·4*b*
23	3474	,,	Cn	g−4, k+4	3·1
23	3474	B	Bh	k (1) v (1) m	3·8*b*
25	3476	,,	,,	g (1) v (1) k	3·1*b*
25	3476	NE	Lp	g (2) v (2) k	3·1*b*
26	3477	B	Ni	g (8) v (4) k	3·3
26	3477	NE	Ca	h (2) v (2) γ Erid	3·1
27	3478	,,	,,	α Lep (2) v (1) β Lep	2·9
27	3478	B	Bh	g (1) v (3) m, k+5	3·0*b*
28	3479	,,	,,	g (1) v (2) m, k+5	3·1*b*
Mar.					
1	3480	NE	D	g−5, k+1	3·3
2	3481	B	Bh	g (1) v (3) m, k+5	3·0*b*
2	3481	,,	Br	g−3·5, k+5	3·0*b*
2	3481	NE	Ca	h	3·0
4	3483	,,	,,	h	3·0
4	3483	B	Ma	g (4) v (1) k, k+2	3·4*b*
4	3483	NE	Lp	g (2) v (1) k	3·3*b*
4	3483	B	Bn	k−1	3·7
5	3484	,,	Br	g−2	2·9
5	3484	,,	Hw	k	3·6
5	3484	,,	Bh	g (1) v (2) m, k+3	3·2*b*
5	3484	NE	Ca	=g	2·7
6	3485	,,	,,	e (4) v (1) h	2·8
6	3485	,,	Cn	g−1, k+6	2·9
6	3485	B	Bn	k (2) v (3) m	3·8
6	3485	,,	Ma	g (1) v (1) k	3·1
7	3486	,,	,,	g (1) v (1) k, g−2	3·0

Feb. 8, Ma, With 50, Very pale pink. Br, About.
Feb. 11, Co, 8c.
Mar. 4, Ma, Pale yellow.

(806) *o* (MIRA) CETI—*continued.*

1923					
Mar					
8	3487	NE	Ca	e (4) v (1) h	2·8
10	3489	,,	,,	e (4) v (1) h	2·8
10	3489	,,	Cn	g−4, k+5	3·1
11	3490	,,	,,	g−3, k+8	2·9
12	3491	,,	Ca	e (4) v (1) h	2·8
16	3495	,,	Cn	g−3, k+6	3·0
17	3496	,,	,,	g−2, k+6	2·9
17	3496	B	Bh	g (1) v (3) m, k+5	3·0*b*
17	3496	NE	Ca	=g	2·7
23	3502	,,	Cn	g−7, k+3	3·3*b*
24	3503	,,	Ca	h (2) v (3) γ Erid	3·0
25	3504	,,	Cn	g−5, k+5	3·1
29	3508	,,	,,	g−7, k+3	3·3
July					
20	3621	45	Bh	y−1, z+3	6·4*b*
Aug					
1	3633	22	Ni	α (4) v (2) β	7·8
3	3635	,,	,,	α (5) v (2) β	7·8
3	3635	45	Bh	y (1) v (1) α	6·8*b*
6	3638	62	Wf	=β, γ+5, δ+8	8·0*b*
9	3641	45	Bh	β+10	7·0
12	3644	62	Wf	β−4, δ+4	8·4
15	3647	45	Bh	β+5	7·5
15	3647	...	Sa	α−8, β+2	8·0
22	3654	45	Bh	β (1) v (3) ϵ	8·3
28	3660	,,	,,	ϵ+8	8·4
28	3660	...	Sa	β−4, δ+4, ϵ+6	8·5
30	3662	45	Bh	ϵ+6	8·6
Sept					
1	3664	94	Ni	7+1	8·6*b*
2	3665	45	Bh	ϵ+5	8·7*b*
3	3666	94	Ni	=7	8·7
5	3668	62	Wf	δ−2, ϵ+2	9·0
6	3669	94	Ni	7+1·5	8·5
7	3670	...	Sa	δ+1	8·7
7	3670	100	Lp	δ (2) v (2) ϵ	9·0
7	3670	45	Bh	ϵ+3	8·9
8	3671	94	Ni	=7	8·7
9	3672	45	Bh	ϵ+2	9·0
10	3673	32	Ca	δ (2) v (2) ϵ	9·0
10	3673	94	Ni	7 (1) v (4) ϵ	8·8
11	3674	30	D	γ−2, δ+1	8·8
11	3674	25	Bn	γ (4) v (1) δ	8·8
13	3676	22	Ni	7 (3·5) v (1) ϵ	9·1
13	3676	62	Wf	δ−3, ϵ+1	9·1
13	3676	45	Bh	ϵ+1	9·1
15	3678	90	,,	ϵ+1	9·1
15	3678	...	Sa	=δ	8·8
16	3679	100	Lp	=ϵ	9·2
18	3681	30	D	δ−4, ϵ+1	9·2
18	3681	22	Ni	7 (4) v (1) ϵ	9·1
21	3684	94	,,	7 (2) v (2) ϵ	8·9
23	3686	50	Bn	δ (3) v (1) ϵ	9·1
26	3689	90	Bh	ϵ−1	9·3
30	3693	,,	,,	=ϵ	9·2
30	3693	94	Ni	7 (3) v (2) ϵ	9·0
Oct					
1	3694	62	Wf	ϵ+0·5	9·1
4	3697	50	Bn	ϵ (1) v (1) D	9·8
4	3697	100	Lp	ϵ (2) v (2) D	9·8
4	3697	90	Bh	=ϵ	9·2
6	3699	94	Ni	ϵ+1	9·1
7	3700	90	Bh	=ϵ	9·2
8	3701	32	Ca	=ϵ	9·2

Sept. 1, With 22, 8·9. Both obs. very difficult.
Sept. 3, 6, 8, 10, Ni, With 22, 9·0.

1923					
Oct					
9	3702	94	Ni	=ϵ	9
9	3702	62	Wf	=ϵ	9
11	3704	45	Br	ϵ+1	9
11	3704	90	Bh	ϵ−2	9
12	3705	60	Ga	=ϵ	9
12	3705	94	Ni	ϵ+1·5	9
13	3706	...	Sa	=ϵ	9
13	3706	100	Lp	ϵ−1	9
14	3707	120	Bn	=ϵ	9
15	3708	60	D	δ−3, ϵ+1	9
17	3710	80	Co	ϵ+2	9
17	3710	90	Bh	ϵ−2	9
19	3712	60	D	ϵ−1	9
21	3714	94	Ni	ϵ+0·5	9
23	3716	90	Bh	=ϵ	9
26	3719	94	Ni	ϵ−1	9
26	3719	90	Bh	ϵ−2	9
28	3721	32	Ca	ϵ (1) v (1) D	9
28	3721	50	Bn	ϵ+0·5	9
29	3722	60	D	ϵ−2	9
30	3723	62	Wf	δ−2, ϵ+1	9
30	3723	90	Bh	=ϵ	9
31	3724	70	Gr	=ϵ	9
Nov					
1	3725	32	Ca	δ (3) v (1) ϵ	9
2	3726	60	D	δ−3, ϵ+1	9
2	3726	30	Co	ϵ+3	8
3	3727	45	Bh	ϵ+1	8
3	3727	100	Lp	ϵ (2) v (2) D	9
4	3728	160	Br	ϵ+2	9
4	3728	60	D	δ−3, ϵ+1	9
6	3730	50	Ma	ϵ−2	9
6	3730	...	Sa	=ϵ	9
6	3730	90	Bh	ϵ−1	9
7	3731	50	Bn	δ (2) v (1) ϵ	9
7	3731	94	Ni	ϵ+1	9
8	3732	,,	,,	ϵ+1·5	9
10	3734	,,	,,	ϵ+1·5	9
10	3734	40	Hw	=ϵ	9
11	3735	32	Ca	δ (2) v (1) ϵ	9
11	3735	90	Bh	=ϵ	9
14	3738	94	Ni	ϵ+1	9
16	3740	,,	,,	ϵ+1	9
17	3741	50	Bn	δ−3, ϵ+1	9
18	3742	100	Lp	=ϵ	9
18	3742	45	Bh	ϵ+1	9
23	3747	90	,,	ϵ+2	9
24	3748	...	Sa	ϵ+1	9
26	3750	32	Ca	δ (2) v (2) ϵ	8
30	3754	40	Hw	=δ	8
30	3754	50	Bn	δ (2) v (1) ϵ	9
30	3754	90	Bh	ϵ+3	8
Dec					
1	3755	...	Cm	δ−3, ϵ+1	9
2	3756	90	Bh	ϵ+2	9
3	3757	...	Sa	δ−1, ϵ+4	8

Oct. 12, Ga, T. Ni, With 22, 9·3.
Oct. 15, 7°.
Oct. 30, Bh, Unsteady.
Nov. 4, Br, Slightly yellow.
Nov. 6, Ma, Reddish.
Nov. 7, Ni, With 22, 9·3.
Nov. 8, 10, Ni, With 22, 9·2.
Nov. 14, 16, With 22, 9·2.
Nov. 17, Red.
Dec. 1, About.

(806) *o* (MIRA) CETI—*continued.*

1923 Dec					
3	3757	...	Cm	δ−2, ε+2	9·0
4	3758	45	Bh	ε+3	8·9
4	3758	100	Lp	δ (2) v (2) ε	9·0*b*
4	3758	50	Ma	ε+3	8·9
5	3759	,,	,,	=δ, ε+5	8·8
5	3759	32	Ca	γ (3) v (3) ε	8·9
8	3762	45	Bh	β (1) v (2) ε	8·4
9	3763	160	Br	β−3, δ+5	8·3
9	3763	100	Lp	=γ	8·6*b*
9	3763	50	Ma	δ+2, ε+5	8·7
9	3763	B	Cn	β−5, =7, δ+5	8·5*b*
9	3763	30	D	β−5, δ+3, ε+6	8·5
9	3763	94	Ni	=7, ε+4	8·7
0	3764	32	Ca	γ (1) v (1) δ	8·7
2	3766	45	Bh	β (1) v (4) ε	8·3
3	3767	30	Sm	β (1) v (1) δ	8·4
5	3769	50	Ma	δ+7	8·1
5	3769	,,	Bn	β−1, γ+4·5	8·1
6	3770	32	Ca	=β	8·0
8	3772	45	Bh	β+1	7·9
8	3772	...	Sa	α−4, β+3	7·7
0	3774	50	Bn	α (2) v (1) β	7·8
2	3776	45	Bh	β+5	7·5
3	3777	50	Ma	δ+10	7·8*b*
4	3778	22	Ni	β (2·5) v (5) 7	8·2
4	3778	...	Sa	α−2, β+4	7·6
4	3778	40	Hw	=β	8·0*b*
6	3780	B	Cn	α−3, K−3	7·6
8	3782	,,	Br	α−4, β+4	7·7
8	3782	...	Sa	α−5, β+3	7·8
8	3782	45	Bh	=α, β+6	7·4*b*
8	3782	30	Sm	β+10	7·0
8	3782	B	Ma	M−5, α+2	7·3*b*
0	3784	,,	,,	M−3, α+2	7·2*b*
0	3784	45	Bh	α+5, β+12	6·8*b*
0	3784	B	Cn	α+2, =M	7·0
0	3784	,,	Ca	z (5) v (1) α	7·2
0	3784	30	D	y (3) v (2) α, α+5	6·9
0	3784	22	Ni	z (3) v (2) M	6·8
24					
n					
1	3786	B	Br	z−3, α+3	7·0*b*
1	3786	,,	Ca	z (5) v (1) α	7·2
2	3787	,,	,,	z (3) v (3) α	7·0
2	3787	,,	Bn	y+1	6·3
2	3787	,,	Br	z−2	6·9
2	3787	37	Lp	y (3) v (2) α	6·9*b*
3	3788	45	Bh	z+5, α+10	6·2
3	3788	B	Sa	y+1	6·3
3	3788	40	Hw	=y	6·4*b*
4	3789	B	Br	=y	6·4
4	3789	,,	Cm	y−1, z+2	6·5
4	3789	,,	Ni	y (3) v (1) z	6·6
5	3790	,,	Bh	s (1) v (2) P	5·5*b*
5	3790	,,	Cn	y−1, z+6	6·3
5	3790	,,	My	y+1	6·3*b*
5	3790	40	Hw	=y	6·4
5	3790	B	Li	u (5) v (5) x	5·9
6	3791	,,	,,	=w	5·8
6	3791	,,	Bg	=w, x+2	5·9
6	3791	,,	Bn	w (4) v (1) y	6·3

1924 Jan					
6	3791	B	Br	x−1, y+2	6·2
6	3791	F	Sm	=N	5·6
6	3791	B	Cm	x−1, y+2	6·2*b*
6	3791	,,	Ni	N (5) v (2) y, N−5, L−1, y+1	6·2
6	3791	,,	Ca	x (2) v (1) y	6·3
7	3792	NE	,,	=x	6·1
8	3793	,,	,,	w (2) v (3) y	6·0
9	3794	B	,,	u (1) v (1) w	5·8
9	3794	,,	Wf	t−3, y+5	5·8
9	3794	B	Cm	u−1, w+0·5	5·8*b*
10	3795	NE	My	y+3	6·1
10	3795	B	Ca	t (1) v (2) w	5·6
11	3796	,,	Ni	N (2) v (2) L	5·8
11	3796	,,	Cm	=w, =P	5·9
11	3796	,,	Li	r (7) v (3) s	5·3
12	3797	,,	Cn	t−2, N−1	5·7
13	3798	,,	Cm	u−0·5, w+1	5·7
13	3798	,,	Ca	s (1) v (2) u	5·5
15	3800	,,	,,	q (3) v (3) t	5·2
15	3800	,,	Li	R (2) v (8) r	4·8
15	3800	,,	Ni	t (1) v (2) N	5·6
16	3801	,,	,,	t+1·5	5·4
16	3801	NE	My	t+1	5·4*b*
17	3802	40	Hw	v (5) y (5) α	5·4*b*
17	3802	B	Ca	r (1) v (2) s	5·2
18	3803	,,	,,	=r	5·1
19	3804	,,	,,	q (1) v (1) r	5·0
19	3804	,,	Bn	R (2) v (5) w	5·1*b*
19	3804	,,	Wf	s+2, t+3·5	5·2
19	3804	,,	Ni	r (4) v (2) t	5·4
20	3805	,,	,,	r (2) v (4) t	5·2
20	3805	,,	Bn	R (1) v (3) s	4·9
23	3808	,,	D	r−3, t+1	5·4
23	3808	NE	Ca	q (1) v (1) r	5·0
23	3808	B	Ni	r+0·5	5·1
24	3809	,,	,,	r−1	5·2
24	3809	,,	Li	n (8) v (2) R	4·7
25	3810	,,	Cm	=r	5·1
25	3810	NE	Ca	q (1) v (1) r	5·0
25	3810	B	Br	m−6, r+3	4·8
25	3810	,,	Sa	=t, w+2	5·6
25	3810	NE	My	t+5	5·0*b*
25	3810	37	Lp	=t	5·5*b*
25	3810	NE	Ma	=p	4·6
25	3810	40	Hw	v (6·5) y (3·5) α	4·7*b*
25	3810	B	Bn	m (5) v (1) R	4·7
26	3811	,,	Li	o (7) v (3) R	4·7
26	3811	NE	Sm	n (2) v (1) r	4·8
26	3811	B	Cm	q−0·5, r+1	5·0*b*
27	3812	,,	,,	p−1, R+0·5	4·7*b*
27	3812	,,	Ni	=r	5·1
27	3812	,,	D	r−2·5, t+1·5	5·4
27	3812	NE	Ca	q (1) v (1) r	5·0
27	3812	B	Sa	q−1, r+1, t+7, N+5	5·0
27	3812	,,	Ma	p (1) v (1) ν Ceti	4·8

Dec. 4, Bh, Orange. Ma, Orange-red.
Dec. 9, Ma, Pinky red. Ni, With 22, 9·0.
Dec. 15, 23, Ma, Pale red.
Dec. 30, D, 6ᶜ. With B, 7·1. Ni, With B, 7·3.
Jan. 1, Br, Somewhat uncertain.

Jan. 6, Cm, Doubtful.
Jan. 11, 13, Cm, Yellowish.
Jan. 15, 16, Ni, Difficult.
Jan, 25, Cm, Orange.
Jan. 25, Lp, Red. Ma, About. With 50, pale orange with touch of pink. Hw, Very red, With B, 5·2.
Jan. 26, Cm, Yellow.
Jan. 27, Cm, About. Yellow.

(806) o (MIRA) CETI—*continued.*

1924 Jan					
27	3812	B	Hw	1 (5) v (5) s	4·6
27	3812	,,	Br	m−6, =R, r+3	4·8
28	3813	NE	My	m−3	4·4*b*
28	3813	,,	Cm	q−0·5, r+1	5·0
28	3813	,,	Cn	r−2, t+6	5·1
29	3814	,,	,,	r−2, t+4	5·2
29	3814	B	Li	p (3) v (7) r	4·7
29	3814	NE	Ca	q (1) v (1) r	5·0
29	3814	B	Sa	m−10, N+2, w+4	5·3*b*
31	3816	NE	Sm	r+1	5·0
31	3816	B	Li	p (4) v (6) R	4·7
31	3816	NE	Cn	=r, t+6	5·0
31	3816	,,	Ca	q (1) v (1) r	5·0
Feb					
1	3817	,,	Bn	=R	4·8
1	3817	NE	Ma	*ν* Ceti+1	4·9
1	3817	,,	Cn	=r, t+5	5·1
1	3817	B	D	r−4, t+2	5·4
1	3817	,,	Ni	=r	5·1
2	3818	,,	Li	p (4) v (6) R	4·7
2	3818	100	Lp	=r	5·1*b*
3	3819	NE	Cm	=r	5·1*b*
3	3819	,,	Cn	r−1, t+5	5·1
3	3819	B	Br	R+1	4·7*b*
3	3819	NE	My	m−3	4·4
4	3820	B	Bn	R (1) v (1) s	5·1
4	3820	,,	Li	=o	4·4
5	3821	NE	Ca	q (1) v (1) r	5·0
6	3822	B	Sa	m−6, R−2, s+6, N+3	5·0
6	3822	NE	Ma	=*ν* Ceti	5·0*b*
6	3822	,,	Sm	n (1) v (2) r	4·5
6	3822	B	Cm	q−0·5, r+1	5·0
7	3823	,,	Li	p (3) v (7) R	4·7
7	3823	NE	My	m−3	4·4
8	3824	,,	Cm	r−0·5	5·2
8	3824	,,	Ca	q (1) v (1) r	5·0
8	3824	B	Wf	R−5, t+5, N+6	5·1
8	3824	,,	Hw	m (7) v (3) s	5·0*b*
12	3828	,,	Li	p (4) v (6) R	4·7*b*
12	3828	NE	Cn	=r	5·1
12	3828	B	Ca	g (1) v (1) r	5·0
13	3829	NE	,,	=r	5·1
13	3829	,,	My	m−2	4·3
14	3830	B	Ni	r+0·5	5·1
14	3830	NE	Cn	=r	5·1*b*
14	3830	B	D	r−3, t+2	5·4*b*
15	3831	NE	Ca	=r	5·1
16	3832	B	Bn	R (4) v (3) s	5·1
16	3832	,,	Cm	r−0·5	5·2*b*
16	3832	,,	D	r−1, t+3	5·2*b*
17	3833	,,	,,	r−3, t+1	5·4*b*
17	3833	NE	Cn	o−4, r+1, t+7	4·9*b*
17	3833	B	Ca	r (1) v (2) s	5·2
18	3834	,,	,,	=r	5·1
20	3836	NE	,,	r (1) v (2) s	5·2
20	3836	,,	My	m−3	4·4
20	3836	B	Wf	R−2, =r, s+4	5·0
22	3838	NE	Ca	=r	5·1
22	3838	B	Ni	r+1	5·0
23	3839	,,	,,	r−1	5·2
23	3839	,,	D	r−4, t+2	5·4*b*
24	3840	NE	Ca	q (1) v (1) r	5·0

Jan. 28, Cm, Orange.
Feb. 6, Cm, Orange.
Feb. 16, D, Difficult.

1924 Feb					
24	3840	B	Sa	m−7, t+7, N+4	5
24	3840	,,	Cn	q−3, =r, s+5, t+5	5
24	3840	,,	Bn	R (1) v (2) s	5
24	3840	,,	Br	R−2, r+2	4
25	3841	NE	My	m−2	4
25	3841	B	Cm	r+1	5
26	3842	,,	Cn	p−4, q−2, =r, s+4, t+4	5
26	3842	NE	Ca	q (1) v (1) r	5
28	3844	B	Wf	R−2, =r	5
28	3844	,,	Br	r−1, s+1	5
28	3844	NE	Ca	q (1) v (1) r	5
28	3844	,,	Sm	=n	4
28	3844	B	Ni	r (1) v (5) t	5
29	3845	NE	My	m−3	4
Mar					
1	3846	45	Bh	z+10	5
1	3846	B	Wf	R−1	4
2	3847	,,	Bn	R (2) v (1) s	5
2	3847	NE	Ca	=r	5
3	3848	,,	,,	r (1) v (2) s	5
3	3848	,,	My	m−5	4
3	3848	B	Wf	R−2, r+1	5
3	3848	,,	Li	p (5) v (5) q	4
3	3848	,,	Ni	r (1·5) v (4) t	5
4	3849	,,	,,	r (2·5) v (4) t	5
4	3849	,,	D	r−4, t+1	5
4	3849	,,	Bn	R (2) v (1) s	5
5	3850	,,	Wf	N+6·5	5
5	3850	NE	Ca	=r	5
7	3852	,,	,,	=r	5
7	3852	,,	My	m−5	4
8	3853	B	Ni	r (5) v (4) t	5
8	3853	NE	Ca	q (1) v (1) r	5
8	3853	B	D	=t	5
9	3854	,,	,,	r−2, t+1	5
9	3854	,,	Li	p (5) v (5) q	4
9	3854	,,	Ry	R+1	5
9	3854	45	Bh	t (1) v (3) z	5
10	3855	B	Ca	q (1) v (1) r	5
11	3856	,,	Bn	s+3	5
11	3856	45	Bh	s−2, t−1, z+8	5
12	3857	31	D	t+2	5
12	3857	B	Cn	r−2, t+2, N+3	5
13	3858	,,	Ca	=r	5
16	3861	,,	Ry	R−0·5, s+3·5	5
July					
9	3976	90	Bh	=*β*	5
11	3978	32	Ca	*δ* (1) v (3) *ε*	5
14	3981	45	Bh	*β* (1) v (3) *ε*	5
23	3990	,,	,,	*β* (1) v (1) *ε*	5
27	3994	90	,,	*β* (2) v (1) *ε*	5
30	3997	45	,,	*β* (2) v (1) *ε*	5
Aug					
3	4001	90	,,	*ε*+3	5
4	4002	62	Wf	*ε*+1	5
6	4004	94	Ni	*ε*+1	5
8	4006	45	Bh	*β* (3) v (1) *ε*	5
9	4007	62	Wf	*ε*+0·5	5
9	4007	50	Ry	7−2, *ε*+1	5
15	4013	45	Bh	*ε*+1	5

Feb. 28, Mar. 3, Ni, Difficult.
Mar. 8, D, Difficult.
Aug. 6, With 22, 9·3.
Aug. 9, Ry, T.

(806) *o* (MIRA) CETI—*continued.*

24					
ig					
5	4023	45	Bh	=ϵ	9·2
5	4023	35	Ry	ϵ−1, 11+2	9·2
5	4023	62	Wf	=ϵ	9·2
5	4023	75	Bn	ϵ+1	9·1
7	4025	60.	D	=ϵ	9·2
1	4029	75	Bn	ϵ−1	9·3
1	4029	62	Wf	=ϵ	9·2
pt					
2	4031	,,	,,	ϵ−0·5	9·2
2	4031	34	Sa	=ϵ	9·2*b*
2	4031	45	Bh	ϵ−1	9·3
5	4034	90	,,	ϵ+2	9·4
2	4041	45	,,	=ϵ	9·2
2	4041	94	Ni	7 (3·5) v (1·5) ϵ	9·0
4	4043	,,	,,	ϵ+1	9·1
7	4046	45	Bh	ϵ+2	9·0
7	4046	134	Sa	ϵ−2	9·4*b*
9	4048	62	Wf	δ−1, ϵ+3	8·9
2	4051	50	Bn	ϵ (1) v (1) D	9·8
2	4051	30	Sm	ϵ+2	9·0
2	4051	90	Sa	=ϵ	9·2
3	4052	60	D	δ−2, ϵ+2	9·0
4	4053	45	Bh	=ϵ	9·2
7	4056	90	,,	=ϵ	9·2
7	4056	32	Ca	ϵ (1) v (1) D	9·8
7	4056	75	Bn	ϵ (1) v (1) D	9·8
7	4056	62	Wf	=ϵ	9·2
8	4057	,,	,,	ϵ+1	9·1
9	4058	90	Bh	ϵ−1	9·3
0	4059	55	Ry	ϵ−2·5	9·4
ct					
1	4060	210	Sa	ϵ+1	9·1
2	4061	90	Bh	ϵ−1	9·3
3	4062	32	Ca	δ (4) v (1) ϵ	9·1
4	4063	34	Li	γ (8) v (2) δ	8·8
5	4064	62	Wf	=ϵ	9·2
5	4064	90	Bh	=ϵ	9·2
6	4065	134	Sa	ϵ+1	9·1
7	4066	32	Ca	δ (2) v (2) ϵ	9·0
8	4067	90	Bh	=ϵ	9·2
9	4068	32	Ca	δ (2) v (2) ϵ	9·0
1	4070	90	Bh	ϵ+1	9·1
3	4072	,,	,,	ϵ+1	9·1*b*
6	4075	32	Ca	δ (2) v (2) ϵ	9·0
8	4077	,,	,,	δ (2) v (2) ϵ	9·0
9	4078	,,	,,	δ (1) v (3) ϵ	8·9
9	4078	50	Bn	γ (1) v (2) δ	8·7
9	4078	,,	Ry	7−1, δ−1, ϵ+2	8·9
1	4080	32	Ca	=δ	8·8
2	4081	30	Lp	=δ	8·8
2	4081	94	Ni	7 (2) v (4) ϵ	8·9
3	4082	45	Bh	β (3) v (1) ϵ	8·9
3	4082	134	Sa	ϵ+3	8·9*b*
3	4082	40	Hw	β (5) v (5) δ	8·4
3	4082	25	Bn	γ (2) v (1) δ	8·7
4	4083	22	Ni	7 (4) v (2) ϵ	9·0
5	4084	32	Ca	γ (2) v (4) ϵ	8·8
6	4085	30	Sm	β (1) v (1) δ	8·4
7	4086	32	Ca	γ (2) v (4) ϵ	8·8
7	4086	45	Bh	β (1) v (2) ϵ	8·4
0	4089	32	Ca	γ (2) v (4) ϵ	8·8
1	4090	,,	,,	γ (1) v (1) δ	8·7
1	4090	45	Bh	=β	8·0

Oct. 19, Ry, T.
Oct. 22, Lp, 5-in. OG. Ni, With 22, 9·0.

1924					
Nov					
1	4091	30	Sm	β−2	8·2
1	4091	34	Sa	β−4, γ+2, ϵ+7	8·4*b*
2	4092	32	Ca	=γ	8·6
3	4093	25	Bn	β (4) v (1) γ	8·5
3	4093	34	Sa	β−2, δ+4	8·3
3	4093	B	D	β−2	8·2*b*
3	4093	30	Sm	β (2) v (3) δ	8·3
3	4093	45	Bh	β+1	7·9
3	4093	22	Ni	7 (1) v (4) ϵ, =7	8·7*b*
4	4094	,,	,,	β (7) v (1) 7	8·6
4	4094	34	Li	α (7) v (3) β	7·8
4	4094	40	D	β−5, γ+2	8·5
4	4094	32	Ca	β (5) v (1) γ	8·5
4	4094	90	Hw	β (5) v (5) δ	8·4*b*
5	4095	22	Ni	β (4) v (4) 7	8·4
8	4098	,,	,,	β (3) v (3) 7	8·4
8	4098	45	Bh	β+3	7·7
10	4100	,,	,,	α (2) v (1) β	7·8
10	4100	32	Ca	α (5) v (2) β	7·8
12	4102	,,	,,	α (3) v (4) β	7·6
13	4103	,,	,,	=α	7·3
15	4105	,,	,,	M (1) v (1) α	7·1
15	4105	B	Cn	α−5, =K, β+7	7·5
15	4105	30	Sm	β+4	7·6*b*
15	4105	45	Bh	y−10, =α	7·3
15	4105	22	Ni	α (4) v (3) β	7·7
16	4106	20	Ry	α−2, β+5·5	7·5
17	4107	34	Li	y (8) v (2) z	6·6
17	4107	30	D	y (4) v (1) α, α+2	7·1
17	4107	34	Sa	z−7, β+7	7·3
19	4109	45	Bh	y (1) v (1) α	6·8
20	4110	32	Ca	=z	6·7
21	4111	,,	,,	z (2) v (2) M	6·8
21	4111	B	Cn	y−4, =z	6·7
21	4111	30	Sm	=y	6·4
22	4112	B	Ca	z (1) v (3) M	6·7
23	4113	,,	,,	y (2) v (1) z	6·6
23	4113	,,	Ni	N (2) v (2) L	5·8*b*
23	4113	30	Sm	y+2	6·2
24	4114	45	Bh	=y	6·4
24	4114	NE	Ca	P (4) v (1) y	6·3
25	4115	B	Ni	N (3) v (1) L	5·9*b*
27	4117	,,	Bg	r (2) v (1) s	5·3
27	4117	,,	Bn	w (1) v (4) y	5·9
27	4117	40	Hw	v (5) y (5) α	5·4*b*
27	4117	B	Co	=s	5·4
28	4118	,,	Ni	t+0·5	5·5
28	4118	45	Bh	y+4	6·0
29	4119	NE	Ry	R−5, s+2·5	5·2
29	4119	B	Cn	=s, =t, N+3, u+3	5·4
29	4119	,,	Wf	t+1, N+2	5·4
29	4119	,,	Ma	N+5, y+8, z+6 M+10	5·7
29	4119	NE	Ca	=r	5·1
30	4120	,,	,,	q (1) v (1) r	5·0
30	4120	B	D	r−3, t+1	5·4
30	4120	45	Bh	y+6	5·8*b*
30	4120	B	Co	=r	5·1*b*
30	4120	,,	Ni	r (2) v (3) t	5·3
Dec					
1	4121	NE	Ca	=q	4·9
2	4122	45	Bh	y+5	5·9

Nov. 3, D, Difficult.
Nov. 27, Hw, With B, 5·9.
Nov. 29, Ma, Pale yellow.
Dec. 2, With B, 5·7.

(806) *o* (MIRA) CETI—*continued.*

1924 Dec					
3	4123	NE	Ry	R−1, ρ Ceti+1·5	4·8
3	4123	B	Li	q (5) v (5) r	5·0
3	4123	NE	Ca	=q	4·9
5	4125	,,	,,	=q	4·9
5	4125	B	Bn	m (3) v (1) R	4·6
5	4125	,,	Co	=q, r+2	4·9
5	4125	NE	Sm	m (1) v (1) r	4·6
5	4125	B	Ni	=r	5·1
6	4126	,,	Ha	m (1) v (4) n	4·2*b*
7	4127	NE	Ca	=p	4·6
8	4128	B	,,	m−3, n (1) v (2) p, =o	4·4
8	4128	NE	My	m−5	4·6*b*
9	4129	B	Bn	m (1) v (4) R	4·3
10	4130	,,	Ha	n (1) v (2) p	4·4
10	4130	NE	Ca	o (1) v (1) p	4·5
11	4131	,,	,,	m−3, n (1) v (2) p, =o	4·4
12	4132	,,	,,	=n	4·3
12	4132	,,	Cn	m−5	4·6
12	4132	,,	Bh	=l, =m	4·0
13	4133	,,	,,	=k, =l	3·7
13	4133	,,	Cn	m−5, =n, o+2, p+2	4·4
13	4133	B	Li	m (7) v (3) n	4·2
13	4133	NE	My	m−2	4·3*b*
14	4134	B	Ni	=p	4·6*b*
14	4134	,,	Co	=o	4·4*b*
14	4134	NE	Wb	m (2) v (3) o	4·2
14	4134	,,	Ca	m (1) v (1) n	4·2
14	4134	B	Sa	k−3, m+2, =n, o+2	4·1
14	4134	NE	Ma	l−2, m−4	4·3
14	4134	F	Lp	=m	4·1*b*
14	4134	B	Hw	=m	4·1
14	4134	NE	Ha	m (1) v (1) R	4·5*b*
14	4134	B	Bn	k−5, m+1	4·0
14	4134	NE	Bg	n (1) v (1) o	4·3
15	4135	,,	Sm	=m	4·1
15	4135	B	Li	m (3) v (7) n	4·2
16	4136	NE	Ca	m (1) v (2) n	4·2
17	4137	,,	,,	=m	4·1
17	4137	,,	Ha	k (1) v (1) m	3·8
17	4137	,,	My	m−1	4·2
17	4137	,,	Ry	m−1·5	4·3*b*
18	4138	,,	Ca	l (2) v (1) m	4·0
18	4138	B	Co	n−1	4·4*b*
18	4138	NE	Cn	m−2, =n, p+1	4·4
19	4139	,,	,,	m−1, n+1, p+2	4·3
19	4139	,,	My	m+1	4·0
19	4139	B	Sa	l (1) v (1) m	4·0
19	4139	NE	Bh	l (1) v (1) m	4·0
20	4140	,,	Ca	l (2) v (1) m	4·0
20	4140	,,	Sm	=l	3·8
21	4141	,,	My	m+2	3·9
21	4141	B	Sa	k−4, m+2	3·9
22	4142	,,	Co	l−2, m−3	4·2*b*
22	4142	NE	Bg	l (2) v (1) m	
22	4142	,,	Hw	=m	
22	4142	,,	Ca	k (1) v (2) l	
22	4142	,,	Sm	=l	
22	4142	,,	Bh	=l	
22	4142	B	Ni	m (1·5) v (1·5) p	
23	4143	,,	,,	k (6) v (1) m	
23	4143	NE	My	l−3	
23	4143	B	D	m−3	
24	4144	,,	,,	m (1) v (4) r, m−2	
24	4144	,,	Bn	k (3) v (1) m	
24	4144	NE	Hw	=m	
24	4144	B	Ma	k (4) v (1) m, m+2	
24	4144	NE	Ca	k (1) v (2) l	
24	4144	,,	Cn	=m, n+2, p+3	
24	4144	,,	Ry	=m	
24	4144	B	Co	l−1, =m	
25	4145	,,	,,	l−2, =m	
25	4145	NE	Wf	m (1) v (1) n	
26	4146	,,	Bg	l (1) v (1) m	
26	4146	B	Bn	k−5, m+1	
26	4146	NE	Hw	=m	
26	4146	,,	Ha	k (2) v (3) m	
26	4146	,,	Ma	k (3) v (1) m, m+2	
26	4146	,,	D	=n	
26	4146	B	Co	=l	
26	4146	NE	Bh	=l	
26	4146	B	Ni	k (6) v (2) m	
26	4146	,,	Sa	k−3, =l, m+2	
27	4147	,,	,,	l−2, m+1	
27	4147	NE	Cn	=m, n+2, p+3	
27	4147	,,	Ma	k (1) v (3) m	
28	4148	B	,,	k (1) v (1) m	
28	4148	,,	Bn	m+1	
28	4148	NE	Wb	=m	
28	4148	,,	Lp	=l	
28	4148	,,	Ha	k (1) v (4) m	
28	4148	,,	Bh	=l	
28	4148	B	Ni	k (5) v (2) m	
28	4148	,,	D	m−1, n+1	
29	4149	,,	,,	m−2	
29	4149	NE	Ry	l−4, m+1	
29	4149	,,	Sm	k (1) v (1) l	
29	4149	,,	My	l+2	
30	4150	,,	Bg	=l	
30	4150	B	Bn	k (4) v (1) m	
30	4150	NE	Hw	=m	
30	4150	B	Lp	l (2) v (2) m	
30	4150	,,	Co	k−1, l+2	
30	4150	,,	Sa	=l	
30	4150	NE	Bh	k (1) v (1) l	
30	4150	,,	Ma	k (1) v (1) m, l+1	
31	4151	,,	My	l+2	
31	4151	,,	Ca	=l	
31	4151	B	Ni	k (5) v (2) m	

Dec. 5, Ni, Difficult.
Dec. 14, Ni, About. Ma, With 79, very pale orange, almost white.

Dec. 28, Ma, With 50, nearly white, with lea touch of yellow or straw.
Dec. 30, Ma, White, with touch of straw.

(5504) S CORONÆ. (V. 2.)

H.D. 151731.

Julian Date.	Inst.	Observer.	Comparisons.	Deduced Mag.	Date.	Julian Date.	Inst.	Observer.	Comparisons.	Deduced Mag.
					1920 Mar					
2325	30	Bn	2 (1) v (4) 4	7·1	12	2396	50	Bn	5 (4) v (1) 7	8·9
2325	22	Ni	2 (4) v (4) 4	7·4	18	2402	30	D	7−1, 9+3	9·1
2329	90	Bh	2−1	7·1	18	2402	22	Ni	6 (3) v (1) 9	9·2
2332	30	Bn	2−0·5	7·0	18	2402	45	Br	5−2, 7+3	8·7
2333	45	Bh	=2	7·0*b*	18	2402	50	Bn	5−4, 7+1	8·9
2335	22	Ni	2 (4) v (6) 4	7·3	18	2402	90	Bh	5−4, 7+2	8·9
2336	30	Bn	2 (1) v (1) 4	7·4	19	2403	23	Bo	6 (3) v (1) 8	9·1
2337	,,	,,	2 (3) v (2) 4	7·5	21	2405	90	Bh	5−3, 7+3	8·8
2339	45	Bh	2−2	7·2	22	2406	45	,,	5−4, 9+3	9·0
2340	23	Bo	2 (1) v (9) 4	7·0	22	2406	30	D	9−1, 0+2	9·5
2343	,,	,,	2 (1) v (4) 4	7·1*b*	22	2406	50	Bn	7 (2) v (1) 9	9·3
2343	30	Bn	2 (4) v (1) 4	7·6	30	2414	23	Bo	9 (1) v (9) 10	9·5
2345	45	Bh	2−3	7·3	31	2415	45	Bh	7−2, 9+2	9·2
2346	90	,,	2−4, 5+10	7·4	Apr					
2347	23	Bo	2 (1) v (4) 4	7·1	1	2416	22	Ni	9 (1·5) v (4·5) 10	9·6
2347	30	D	2−4, 4+4	7·4	6	2421	23	Bo	9 (1) v (2) 10	9·7
2347	22	Ni	2 (5) v (5) 4	7·4	9	2424	90	Bh	7−5, 10+10	9·4*b*
2348	90	Bh	2−3, 4+6, 5+10	7·3	10	2425	22	Ni	9 (7) v (2) 10	10·1
2350	,,	,,	2−5	7·5	12	2427	90	Bh	7−4, 10+8	9·5
2350	30	Bn	2 (3) v (1) 4	7·6	13	2428	30	D	9 (4) v (1) 10, 10+3	10·0
2350	45	Br	2−1	7·1	14	2429	32	Ca	9−7, 10+1	10·1
2355	23	Bo	2 (3) v (1) 4	7·6	15	2430	23	Bo	9 (2) v (1) 10	10·0
2355	30	Bn	2 (3) v (1) 4	7·6	17	2432	160	Br	10+2	10·1
					17	2432	90	Bh	9−3, 10+6	9·7
2357	22	Ni	2 (6) v (3) 4	7·5	19	2434	79	Ma	10+4	9·9
2360	23	Bo	2 (1) v (1) 4	7·4	20	2435	22	Ni	9 (8) v (1) 10	10·2
2360	90	Bh	2−2, 4+6	7·2	21	2436	75	Bn	10+1	10·2
2366	45	,,	4+3, 5+8	7·6	21	2436	90	Bh	9−6, 10+4	9·9*b*
2366	23	Bo	2 (3) v (1) 4	7·6	27	2442	,,	,,	10+5	9·8
2369	22	Ni	4 (4) v (3) 5	8·2	27	2442	160	Br	10+1	10·2
2370	45	Bh	4+3	7·5	28	2443	79	Ma	10+1	10·2
2371	23	Bo	2 (3) v (1) 4	7·6	May					
2371	30	D	4−1, 5+5	7·9	4	2449	120	Bn	10 (1) v (2) 11	10·5
2372	45	Br	=4	7·8	4	2449	79	Ma	10+2	10·1
2372	,,	Bh	4+2	7·6	4	2449	90	Bh	10+3	10·0
2372	32	Ca	4−4, 5+2	8·2	7	2452	,,	,,	10+2	10·1
2373	23	Bo	2 (4) v (1) 4	7·6	7	2452	50	Bn	10 (1) v (2) 11	10·5
2374	22	Ni	4 (5) v (2) 5	8·3	7	2452	79	Ma	10+1·5	10·1
2377	23	Bo	2 (9) v (1) 4	7·7	7	2452	60	D	10 (1) v (9) 14, 10−2	10·4
2378	90	Bh	4+1	7·7	8	2453	94	Ni	10 (4) v (11) 14	10·7
2378	30	D	=h, 5+5	8·1	9	2454	160	Br	10−1	10·4
2382	23	Bo	=4	7·8	9	2454	80	Ca	10−3, 11+6	10·5*c*
2382	22	Ni	4 (2·5) v (2·5) 5	8·1	9	2454	79	Ma	10+2	10·1
2382	45	Bh	4−2, 5+4	8·0*b*	10	2455	60	D	10 (1) v (3) 14, 10−3	10·6
2384	,,	,,	4−3, 5+3	8·1	13	2458	90	Bh	=10	10·3
					14	2459	120	Bn	10 (2) v (1) 11	10·8
2388	23	Bo	4 (2) v (1) 5	8·3	14	2459	60	D	10 (1) v (1) 14	11·0
2390	50	Bn	5 (2) v (1) 7	8·9	14	2459	79	Ma	10−1	10·4
2391	45	Bh	4−5, 5+1	8·3	16	2461	94	Ni	10 (10) v (6·5) 14	11·2
2392	30	Bn	5 (2) v (1) 7	8·9	18	2463	79	Ma	10 (1) v (1) 14	11·0
2395	45	Br	5−3, 7+3	8·8	21	2466	120	Bn	10 (5) v (1) 11	11·0
2395	,,	Bh	5−3	8·8	22	2467	160	Br	10−2	10·5
2395	32	Ca	5−1, 6+1	8·6*b*	22	2467	79	Ma	10 (6) v (1) 14	11·6
2396	30	D	1−1, 7+1	8·9*b*	23	2468	94	Ni	10 (9) v (4) 14	11·4
2396	23	Bo	4 (7) v (1) 5	8·4	23	2468	90	Bh	10−5	10·8

b. 5, Yellow.

April 27, Bh, Orange.

(5504) S CORONÆ—*continued.*

1920					
May					
29	2474	120	Bn	11+1·5	10·9*b*
June					
2	2478	90	Bh	10−6	10·9
4	2480	,,	,,	10−6, 14+9	10·9
5	2481	160	Br	10−10, 14+5	11·3
6	2482	120	Bn	11 (1) v (1) 13	11·3
8	2484	90	Bh	14+5	11·3
8	2484	80	Ca	10−5, 11+4	10·7*b*
8	2484	94	Ni	10 (15) v (2) 14	11·6
9	2485	120	Bn	11 (3) v (1) 13	11·4
11	2487	,,	D	10 (5) v (1) 14, 14+2	11·6
18	2494	90	Bh	10−10, 14+4	11·3*b*
18	2494	120	Bn	13 (2) v (1) 14	11·7
22	2498	60	D	14−3	12·1*b*
22	2498	79	Ma	14+1·5	11·7
29	2505	90	Bh	14+2	11·6
29	2505	120	Br	14+3	11·5
July					
9	2515	94	Ni	14 (4) v (1) 20	12·3
14	2520	,,	,,	18 (1) v (1) 20	12·3
15	2521	183	Ma	20 (2) v (3) 29	12·8
15	2521	120	Bn	20−2	12·6
17	2523	,,	Br	20−1, =21	12·6
19	2525	94	Ni	=18	12·3
24	2530	79	Ma	14−3	12·1
24	2530	120	Bn	20−3·5, 21−1	12·8
27	2533	94	Ni	18 (4) v (3) 29	12·9*b*
28	2534	79	Ma	20−6	13·0*b*
30	2536	120	Br	20−5	12·9*b*
30	2536	90	Bh	14−8, 18−2	12·6
Aug					
1	2538	183	Ma	20−4·5	12·9*b*
4	2541	94	Ni	18 (4) v (2) 29	13·0
6	2543	120	Br	20−6, 29+3	13·0
8	2545	90	Bh	20−1	12·5
9	2546	183	Ma	29−1·5	13·5
13	2550	90	Bh	14−10, 21−2	12·8*b*
15	2552	183	Ma	=29	13·4
19	2556	160	Bo	29 (1) v (3) 32	13·5
19	2556	90	Bh	20−5	12·9
22	2559	183	Ma	=29	13·4
Sept					
4	2572	90	Bh	18−5, 20−5, 23+1	12·8
4	2572	183	Ma	20−5	12·9
9	2577	94	Ni	18 (4) v (2·5) 29	13·0
10	2578	120	Br	20−5	12·9
12	2580	225	Bo	=31	13·6*b*
12	2580	94	Ni	18 (5) v (2) 29	13·1
13	2581	150	Bh	14−10, 18−6, 20−5	12·9
18	2586	95	Bn	21−1	12·8*b*
18	2586	183	Ma	20−3·5	12·8
19	2587	94	Ni	18 (5) v (2) 29	13·1
19	2587	160	Bo	=29	13·4
26	2594	120	Br	20−1	12·5
26	2594	90	Bh	=18, =20	12·3*b*
29	2597	,,	,,	18−3, 20−2	12·6
Oct					
1	2599	120	Br	20−2	12·6
1	2599	94	Ni	18 (4) v (3) 29	12·9
1	2599	90	Bh	18−2, 20−2	12·5*b*
2	2600	120	Bn	20 (3) v (1) 21	12·6
1920					
Oct					
4	2602	160	Bo	19 (1) v (1) 21	1
6	2604	120	Bn	20 (4) v (1) 21	1
6	2604	90	Bh	18−2, 20−1	1
7	2605	94	Ni	18 (3) v (3) 29	1
9	2607	183	Ma	=20	1
10	2608	160	Bo	20 (1) v (1) 19	1
13	2611	,,	Br	18−1, 20+1	1
14	2612	94	Ni	18 (2) v (3) 29	1
16	2614	160	Bo	18 (3) v (1) 19	1
17	2615	90	Bh	14−8, 18−2, 20−1	1
18	2616	,,	,,	18−1, =20	1
19	2617	94	Ni	18 (2·5) v (4) 29	1
20	2618	130	Bo	16 (1) v (1) 18	1
22	2620	90	Bh	14−4, 18+2, 20+4	1
24	2622	150	Bn	18−1·5	1
25	2623	,,	Bh	14−4, 18+2, 20+4	1
28	2626	,,	Bn	18−1	1
29	2627	94	Ni	14 (3) v (3) 20	1
29	2627	90	Bh	14−3, 18+1·5	1
30	2628	150	,,	14−1	1
30	2628	55	Bo	14 (1) v (3) 16	1
30	2628	120	Br	14−4	1
Nov					
1	2630	94	Ni	14 (4) v (2) 20	1
1	2630	120	Bn	18−1	1
8	2637	90	Bh	14+1	1
11	2640	,,	,,	14+2	1
11	2640	94	Ni	14+1	1
13	2642	90	Bh	10−10, 14+5	1
15	2644	120	Br	14+4	1
16	2645	,,	Bn	13+2	1
16	2645	90	Bh	10−1	1
17	2646	94	Ni	10 (9) v (6·5) 14	1
18	2647	160	Bo	=14	1
20	2649	90	Bh	10+1	1
21	2650	50	Bn	10 (1) v (2) 11	1
22	2651	55	Bo	9 (9) v (1) 10	1
22	2651	45	Bh	10+5	
23	2652	94	Ni	10−2	1
30	2659	90	Bh	5−4, 7+2	
Dec					
1	2660	45	Br	7−2, 9+2	
4	2663	22	Ni	4 (4) v (1) 5	
7	2666	45	Bh	4−3, 5+3	
12	2671	90	,,	2−3, 4+6	
12	2671	32	Ca	4+2	
22	2681	90	Bh	2−4, 4+4, 5+10	
25	2684	45	,,	2−4, 4+4	
31	2690	90	,,	2−2	
1921					
Jan					
7	2697	45	,,	2−2, 4+6, 5+9	
9	2699	22	Ni	2 (6) v (3) 4	
10	2700	90	Bh	2−4, 4+6	
10	2700	30	Bn	2 (1) v (2) 4	
12	2702	55	Bo	2 (1) v (1) 3	
13	2703	90	Bh	2−3, 4+6	
13	2703	30	Bn	2 (2) v (1) 4	
16	2706	22	Ni	2 (6) v (3) 4	
22	2712	,,	,,	2 (10) v (1) 4	
24	2714	45	Bh	2−2, 4+6	
25	2715	32	Ca	2−6, 4+2	
27	2717	45	Bh	2−2, 4+6	
30	2720	,,	,,	2−4, 4+4	
31	2721	50	Bn	2 (5) v (1) 4	

June 22, D, Difficult.
July 28, Doubtful.
July 30, Br, About. Difficult.
Aug. 8, Glimpsed.
Sept. 26, Br, About. Bh, Not sharp.

Nov. 15, About.

(5504) S CORONÆ—*continued.*

2723	90	Bh	4+3	7·5
2725	55	Bo	2 (1) v (2) 4	7·2
2730	32	Ca	2−7, 4+1	7·7
2731	45	Bh	2−6, 4+3	7·5
2731	22	Ni	4 (1) v (4) 5	8·0*b*
2738	45	Br	2−3, 4+5	7·3
2738	,,	Bh	4+4	7·4
2738	50	Bn	2 (3) v (1) 4	7·6
2740	55	Bo	2 (1) v (3) 4	7·2
2741	22	Ni	2 (8) v (4) 4	7·5
2741	90	Bh	2−3, 4+3	7·4
2750	50	Bn	=4	7·8
2751	55	Bo	2 (2) v (1) 4	7·5
2751	45	Bh	4+3, 5+10	7·5
2751	32	Ca	=4	7·8
2751	22	Ni	4+1	7·7
2755	90	Bh	2−4, 4+4	7·4
2756	22	Ni	4 (2) v (2) 5	8·1
2758	55	Bo	2 (3) v (1) 4	7·6
2759	50	Bn	4 (1) v (2) 5	8·0
2759	45	Br	4−3, 5+3	8·1
2760	90	Bh	2−5, 4+2	7·5
2761	32	Ca	4−2, 5+5	8·0
2764	55	Bo	4 (2) v (1) 5	8·3
2765	90	Bh	4+2, 5+6	7·7
2767	50	Bn	4 (3) v (1) 5	8·3
2767	22	Ni	=5	8·5
2769	45	Br	4−3, 5+2	8·2
2770	90	Bh	4+1, 5+4	7·9
2773	45	,,	4−1, 5+3	8·0
2773	50	Bn	5−1	8·6
2778	90	Bh	4−2, 5+4	8·0
2779	55	Bo	5 (1) v (3) 6	8·5
2781	22	Ni	5 (5) v (1) 6	8·7
2781	45	Bh	4−3, 5+4	8·1
2781	30	Bn	5 (4) v (1) 7	8·9
2782	45	Br	5−4, 7+2	8·9
2782	55	Bo	5 (4) v (1) 6	8·7
2782	37	Li	5 (6) v (4) 10	9·5
2783	30	D	5−4, 7+1	8·9
2784	37	Li	4 (5) v (5) 7, 5 (1) v (9) 10	8·5*b*
2786	30	Bn	7 (2) v (1) 9	9·3
2787	37	Li	5 (3) v (7) 7	8·6
2787	55	Bo	6 (1) v (1) 7	8·9
2787	45	Bh	5+1	8·4
2788	32	Ca	9−1, 10+8	9·5
2788	50	Ma	10+6	9·7
2791	22	Ni	9 (4) v (4) 10	9·8
2791	30	D	9 (1) v (4) 10, 9−3	9·6
2792	55	Bo	6 (3) v (1) 7	9·0
2792	75	Bn	7 (3) v (1) 9	9·3
2792	45	Bh	=6	8·8
2798	55	Bo	=7	9·1
2803	45	Bh	5−5	9·0
2805	90	,,	10+10	9·3
2807	,,	,,	10+6	9·7*b*
2807	50	Bn	9 (3) v (1) 10	10·0
2807	32	Ca	9−6, 10+2	10·0
2807	60	D	10+6	9·7
2807	22	Ni	9 (5) v (2) 10	10·0
2808	45	Br	9−2, 10+7	9·6
2808	55	Bo	9 (1) v (2) 10	9·7
2809	90	Bh	10+7	9·6
2810	37	Li	5 (9) v (1) 9, 7 (5) v (5) 10	9·5

1921				
May				
1	2811	70	Bn	10+1	10·2
1	2811	37	Li	9 (5) v (5) 10	9·8
1	2811	79	Ma	10+1	10·2
3	2813	22	Ni	9 (8) v (1·5) 10	10·1
4	2814	80	Ca	9−7, 10+1	10·1*b*
8	2818	37	Li	9 (5) v (5) 10	9·8*b*
8	2818	120	Bn	10+1	10·2
9	2819	90	Bh	10+2	10·1
10	2820	55	Bo	9 (4) v (1) 10	10·1
11	2821	94	Ni	=10	10·3
15	2825	90	Bh	=10	10·3
20	2830	55	Bo	9 (4) v (1) 10	10·1
21	2831	120	Bn	10−2	10·5
23	2833	50	,,	10 (2) v (3) 11	10·6
23	2833	79	Ma	10−2	10·5
23	2833	62	Wf	10−1, 11+4	10·5*b*
23	2833	90	Bh	10−1	10·4
24	2834	37	Li	10 (2) v (8) 14	10·6*c*
24	2834	94	Ni	10 (8) v (6) 14	11·2
25	2835	62	Wf	10−1, 11+4	10·5
31	2841	60	D	10 (2) v (1) 14, 14+5	11·3
June					
1	2842	160	Br	10−3	10·6
1	2842	55	Bo	10 (1) v (5) 11	10·4
3	2844	62	Wf	=11	11·1
4	2845	80	Ca	10−7, 11+1	11·0*b*
5	2846	90	Bh	10−2	10·5
5	2846	60	D	10 (4) v (1) 14, 14+2	11·6
5	2846	94	Ni	10 (10) v (5) 14	11·3*b*
7	2848	50	Bn	11 (1) v (2) 12	11·2
10	2851	90	Bh	10−3	10·6
11	2852	50	Bn	=12	11·3
11	2852	79	Ma	10 (3) v (1) 14	11·4
11	2852	62	Wf	10 (1) v (1) 14	11·0*b*
12	2853	83	Li	10 (8) v (2) 14	11·5*c*
14	2855	55	Bo	11 (1) v (1) 12	11·2
21	2862	90	Bh	10−5	10·8*b*
24	2865	,,	,,	10−7	11·0
25	2866	60	D	<14	<11·8*b*
27	2868	83	Li	14 (3) v (7) 19	12·0*b*
27	2868	90	Bh	10−9, 14+9	11·0
27	2868	120	Br	14−2	12·0
28	2869	,,	Bn	14 (1) v (3) 18	11·9
28	2869	60	D	14−1	11·9
29	2870	,,	,,	14−2, 18+4	12·0
July					
2	2873	94	Ni	14 (3) v (3) 20	12·1
4	2875	90	Bh	14+2	11·6
5	2876	120	Bn	14 (3) v (1) 18	12·2
5	2876	50	Ma	14−1, =18	12·1
8	2879	62	Wf	14−2, 18+3	12·0
8	2879	94	Ni	20 (1) v (2) 18	12·3
9	2880	60	D	=18	12·3*b*
9	2880	120	Bn	18 (1) v (2) 20	12·3
11	2882	90	Bh	=14	11·8
13	2884	150	Wf	14−4, 18+1	12·2
22	2893	,,	,,	20−1	12·5
25	2896	120	Bn	20−2	12·6
30	2901	150	Wf	20−2	12·6
Aug					
3	2905	183	Ma	19−1	12·5
6	2908	90	Bh	18−6	12·9*b*

May 11, With 22, 10·4.
July 8, Ni, 20>18.
July 9, D, About. Difficult.
July 13, 22, 9-in.

(5504) S CORONÆ—*continued.*

1921					
Aug					
6	2908	150	Wf	20−3	12·7
9	2911	160	Bo	19 (1) v (2) 21	12·5*b*
9	2911	120	Bn	20−3	12·7*b*
14	2916	90	Bh	18−6, =23	12·9
21	2923	94	Ni	18 (5) v (1) 29	13·2
23	2925	160	Bo	29 (1) v (1) 30	13·4
25	2927	183	Ma	20−2	12·6
25	2927	90	Bh	18−8, 20−4	12·9
26	2928	94	Ni	18 (5) v (1) 29	13·2
29	2931	79	Ma	=19	12·4
30	2932	120	Br	20−4	12·8
30	2932	90	Bh	18−6, 20−5	12·9
30	2932	160	Bo	29 (1) v (3) 32	13·5
Sept					
3	2936	183	Ma	18−3, =19	12·5
4	2937	160	Bo	29 (1) v (1) 31	13·5
5	2938	90	Bh	18−8, 20−5, 21−4	13·0
6	2939	94	Ni	18 (5·5) v (1) 29	13·2
7	2940	85	Bn	20−2	12·6*b*
9	2942	150	Wf	20−3	12·7
10	2943	120	Br	20−4, 29+6	12·8
20	2953	,,	,,	20−4	12·8*b*
21	2954	,,	Bn	20−2	12·6
21	2954	90	Bh	20−6	13·0
21	2954	150	Wf	<20	12·8*b*
23	2956	94	Ni	18 (4) v (2) 29	13·0
23	2956	160	Bo	24 (1) v (1) 29	13·2*b*
24	2957	120	Bn	20−2, =21	12·6
25	2958	79	Ma	=19	12·4
27	2960	160	Bo	20 (1) v (1) 21	12·5
28	2961	90	Bh	14−10, 20−6	12·9
29	2962	120	Bn	20−1·5	12·6
30	2963	62	Wf	=18	12·3
Oct					
1	2964	94	Ni	18 (4) v (3) 29	12·9
1	2964	120	Br	20−3	12·7
1	2964	150	Bh	20−4, 22−2	12·9
3	2966	160	Bo	=20	12·4*b*
5	2968	90	Bh	18−5, 20−3	12·7
6	2969	62	Wf	=20	12·4
7	2970	140	Bo	20 (1) v (1) 19	12·4
8	2971	90	Bh	18−3, =20	12·5
9	2972	120	Bn	18−2, =20	12·4*b*
14	2977	,,	Br	20−1	12·5*b*
16	2979	90	Bh	14−5, 18−1	12·4
18	2981	120	Bn	18 (1) v (1) 20	12·3*b*
18	2981	,,	Br	=20	12·4
21	2984	62	Wf	14 (1) v (1) 20	12·1
23	2986	120	Bn	14 (3) v (1) 18	12·2
23	2986	,,	Br	20+2	12·2
23	2986	150	Bh	14−3, 18+2	12·1
27	2990	90	,,	=14	11·8*b*
30	2993	80	Ca	14−1, =16	11·9
30	2993	120	Bn	14 (2) v (1) 18	12·1
31	2994	140	Bo	14 (1) v (2) 17	11·9
Nov					
2	2996	150	Wf	14−3, 18+7	11·9*b*
4	2998	120	Br	14−1·5, 18+3	12·0
6	3000	,,	Bn	13+1	11·4*b*
6	3000	90	Bh	14−1	11·9

Aug. 6, Wf, 9-in.
Aug. 9, Bn, t.
Aug. 29, Sept. 25, Oct. 14, About.
Sept. 21, Wf, Estimated.
Oct. 6, 21, 9-in.
Oct. 27, Unsteady.

1921					
Nov					
6	3000	94	Ni	14 (2) v (2) 20	1
12	3006	45	Bh	10−5, 14+10	1
22	3016	94	Ni	9 (6) v (3) 10	1
24	3018	,,	,,	9 (3) v (6) 10	
24	3018	90	Bh	7−1, 9+1	
26	3020	,,	,,	=7	
27	3021	94	Ni	=9	9
Dec					
2	3026	22	,,	5 (2) v (4) 6	
4	3028	45	Bh	4+1	
13	3037	,,	Br	4+2	
15	3039	90	Bh	4+3, 5+9	
23	3047	30	Bn	4+1	
23	3047	22	Ni	=4	
24	3048	45	Bh	2−6, 4+4, 5+8	
25	3049	22	Ni	4−1	
26	3050	45	Bh	2−8, 4+2	
31	3055	90	,,	2−6, 4+3	
1922					
Jan					
3	3058	30	Bn	4 (1) v (1) 5	
3	3058	90	Bh	2−7, 4+3	
10	3065	,,	,,	2−8, 4+2	
18	3073	45	,,	4−1, 5+3	
20	3075	90	,,	4+1	
27	3082	22	Ni	=5	
Feb					
2	3088	45	Bh	4−3, 5+3	
4	3090	30	D	5−3, 7+2	
5	3091	55	Bo	5 (1) v (2) 6	
10	3096	22	Ni	5 (2) v (2) 6	
17	3103	75	Bn	5 (4) v (1) 7	
17	3103	90	Bh	4−6, 5−2	
17	3103	45	Br	4−4, 5+1	
22	3108	62	Wf	5−2, 7+3	
24	3110	22	Ni	9 (3) v (4) 10	
25	3111	55	Bo	6 (1) v (2) 7	
25	3111	27	Li	6 (5) v (5) 7	
26	3112	,,	,,	5 (1) v (9) 6	
26	3112	32	Ca	7−1, 9+3	
26	3112	30	Bn	7 (3) v (2) 9	
26	3112	45	Bh	=5	
28	3114	62	Wf	5−3, 7+2	
Mar					
2	3116	55	Bo	6 (1) v (2) 7	
4	3118	90	Bh	5−5, 9+5	
4	3118	45	Br	7+2	
5	3119	62	Wf	5−3, 7+2	
7	3121	30	Bn	7 (3) v (2) 9	
10	3124	90	Bh	9+4	
15	3129	45	,,	9+2	
17	3131	22	Ni	9 (4) v (3) 10	
18	3132	32	Ca	9−4, 10+4	
18	3132	55	Bo	7 (3) v (1) 9	
19	3133	62	Wf	5−3, 7+2	
19	3133	90	Bh	=9, 10+10	
23	3137	55	Bo	9−1	
25	3139	45	Br	9−4	
25	3139	50	Bn	9 (2) v (1) 10	1
25	3139	32	Ca	9−5, 10+4	
26	3140	62	Wf	5−4·5, 7+1·5	
28	3142	90	Bh	9−3, 10+7	
29	3143	22	Ni	9 (7) v (2) 10	1

Nov. 27, Very uncertain.
Mar. 19, Wf, Red.

(5504) S CORONÆ—*continued.*

3146	50	Bn	9 (3) v (1) 10	10·0	1922 July 23	3259	90	Bh	18−6, 20−3	12·8
3149	90	Bh	9−5, 10+5	9·8	23	3259	150	Wf	19−4, 26+1	12·9
3149	62	Wf	9−2, 10+8	9·5*b*	24	3260	79	Ma	20−1	12·5*b*
3154	22	Ni	9 (6) v (2) 10	10·0	28	3264	120	Bn	20−2	12·6
3159	90	Bh	10+3	10·0	29	3265	140	Bo	21−2	12·9
3161	55	Bo	10+3	10·0	30	3266	120	Br	20−2	12·6
3162	32	Ca	9−7, 10+2	10·1	31	3267	183	Ma	=19, 29−2	13·0
3162	90	Bh	10+2	10·1	Aug 7	3274	94	Ni	18 (3) v (3) 29	12·8*b*
3164	75	Bn	10+1	10·2	11	3278	90	Bh	21−2	12·9
3164	62	Wf	9−6, 10+4	9·9*b*	14	3281	150	Wf	21−1, 29+4	12·9*b*
3165	55	Bo	10+2	10·1	15	3282	120	D	20−2	12·6*b*
3165	94	Ni	10+1·5	10·1	15	3282	94	Ni	18 (3) v (3) 29	12·8
3172	75	Bn	10+0·5	10·2	15	3282	120	Bn	20−3	12·7*b*
3174	160	Br	10+1	10·2	17	3284	79	Ma	=18	12·3*b*
3174	62	Wf	10−1, 11+7	10·4	18	3285	90	Bh	14−10, 21−3	12·9
3174	90	Bh	10+2	10·1	19	3286	140	Bo	21 (2) v (1) 26	12·9
3177	,,	,,	=10	10·3	20	3287	120	Br	20−2	12·6
3179	55	Bo	=10	10·3	21	3288	150	Wf	21−3, 26+2	12·9
3183	90	Bh	=10	10·3*b*	23	3290	183	Ma	20−1	12·5
3187	,,	,,	10−1	10·4	23	3290	90	Bh	=21	12·7
3188	50	Bn	10 (2) v (1) 11	10·8	25	3292	,,	,,	18−5, 20−4	12·8
3188	32	Ca	10−4, 11+4	10·7*b*	25	3292	120	Bn	20−2	12·6
3188	62	Wf	10−4, 11+3	10·7*b*	27	3294	140	Bo	20 (2) v (1) 21	12·6
3188	55	Bo	10−2	10·5	27	3294	94	Ni	18 (3) v (4) 29	12·8
3189	75	Pr	9−4, 10+2	9·9	29	3296	90	Bh	21−3	13·0
3191	140	Bo	10+1	10·2*b*	31	3298	,,	,,	21−1	12·8
3192	90	Bh	10−8, 14+8	11·0	Sept 7	3305	,,	,,	14−10, 20−4	12·8
3195	31	D	14+3	11·5*b*	7	3305	150	Wf	14−6, 19+1	12·4
3196	55	Bo	10−2	10·5*b*	10	3308	94	Ni	=20	12·4
3196	50	Bn	=11	11·1	10	3308	90	Bh	18−4, 20−1	12·6
3196	62	Wf	11−2, 13+7	11·1*b*	13	3311	80	Ca	<18	<12·3
3196	94	Ni	10 (11) v (2·5) 14	11·5	13	3311	62	Wf	14−1, 18+4	11·9
3198	79	Ma	10 (5) v (1) 14, 14+2	11·6	15	3313	120	Br	18−1, 20+1	12·3
3198	32	Ca	12−1, 13+1	11·4*b*	15	3313	85	Bn	14 (3) v (1) 18	12·2*b*
3200	160	Br	14+3	11·5	15	3313	90	Bh	18−3, =20	12·5
3201	90	Bh	10−10, 14+6	11·2	16	3314	150	Wf	14−1, 18+3	12·0
3202	,,	,,	10−8, 14+8	11·0	18	3316	94	Ni	14 (3) v (3) 20	12·1
3202	55	Bo	10 (4) v (4) 11	10·7*b*	20	3318	79	Ma	14 (1) v (3) 29	12·2
3203	94	Ni	10 (15) v (3) 14	11·6	20	3318	120	Bn	14 (2) v (1) 18	12·1
3203	62	D	=14	11·8*b*	21	3319	90	Bh	18+1, 20+3	12·1
3204	,,	Wf	10−5, 11+1	10·9*b*	23	3321	150	Wf	13−2, 14+1	11·7
3206	90	Bh	10−10, 14+6	11·2	30	3328	90	Bh	14−2, 20+2	12·1
3207	50	Bn	11 (3) v (1) 13	11·4	Oct 6	3334	,,	,,	=14	11·8
3211	94	Ni	10 (15) v (1·5) 14	11·7	7	3335	94	Ni	14+1	11·7
3216	90	Bh	14+1	11·7	8	3336	62	Wf	=13	11·5*b*
3217	150	Wf	=14, 18+5	11·8	8	3336	80	Ca	11 (2) v (1) 12	11·3
3218	90	Bh	=14	11·8	12	3340	90	Bh	14+2	11·6
3222	275	Bo	14 (3) v (3) 20	12·1	12	3340	120	Bn	14+2	11·6
3225	90	Bh	14−2	12·0	13	3341	94	Ni	14+2	11·6*b*
3230	62	Wf	14−1, 19+3	12·0	14	3342	160	Br	14+1	11·7
3234	79	Ma	14−2, 20−1	12·3	14	3342	90	Bh	14+3	11·5
3235	90	Bh	14−5	12·3*b*	14	3342	55	Bo	10 (4) v (4) 11	10·7
3237	275	Bo	14 (5) v (1) 20	12·3	15	3343	44	Li	14 (5) v (5) 15	11·8
3238	150	Wf	14−3, 18−1, 20+1	12·3	15	3343	50	Bn	12 (1) v (3) 14	11·5
3246	120	Br	20−1	12·5	15	3343	150	Wf	=13, 14+2	11·6
3246	90	Bh	18−3, 20−1	12·5	17	3345	44	Li	=14	11·8
3248	94	Ni	18 (1) v (1) 20	12·3	18	3346	90	Bh	14+5	11·3
3250	90	Bh	=20	12·4	20	3348	80	Ca	=11, 12+3	11·1
3253	275	Bo	20−3	12·7	22	3350	94	Ni	10 (6) v (8) 14	10·9
3255	120	Bn	20−2	12·6	25	3353	90	Bh	10−8, 14+8	11·0
3257	,,	Br	20−1	12·5	28	3356	50	Bn	10 (4) v (1) 11	10·9

pril 20, Ni, With 22, 10·5.
ay 20, Glimpsed.

Aug. 15, D, 3-in. Bn, t.
Aug. 25, Bn, t.

(5504) S CORONÆ—*continued.*

1922 Nov					
1	3360	120	Br	10−1	10·4
1	3360	90	Bh	10+3	10·0
4	3363	45	,,	10+5	9·8
9	3368	,,	,,	6−5, 10+10	9·3
9	3368	94	Ni	9 (2) v (6) 10	9·6
11	3370	150	Wf	5−3, 7+1	8·9
11	3370	45	Br	7−1, 9+2	9·2
13	3372	50	Bn	7 (2) v (1) 9	9·3
14	3373	90	Bh	=5, 6+4	8·4
18	3377	45	,,	=4	7·8*b*
18	3377	22	Ni	4+1·5	7·7
24	3383	,,	,,	2 (6) v (6) 4	7·4
24	3383	45	Bh	2−2, 4+6	7·2
24	3383	,,	Br	2−2	7·2
24	3383	50	Bn	2 (1) v (7) 4	7·1
29	3388	30	,,	1 (2) v (1) 2	6·9
Dec					
6	3395	,,	,,	=1	6·7*b*
6	3395	45	Bh	2−1	7·1
11	3400	90	,,	2−1	7·1
16	3405	,,	,,	2−2	7·2
20	3409	22	Ni	2+2	6·8
20	3409	31	D	2−1	7·1
20	3409	30	Bn	1+1	6·6
25	3414	90	Bh	=2	7·0
27	3416	45	Br	2+3	6·7*b*
30	3419	22	Ni	2+1	6·9
1923 Jan					
4	3424	90	Bh	=2	7·0
8	3428	22	Ni	2+1	6·9
11	3431	90	Bh	2−1	7·1
14	3434	94	Ni	2+2	6·8
16	3436	45	Bh	2−1	7·1*b*
20	3440	30	Bn	2 (1) v (3) 4	7·2
27	3447	32	Ca	2 (5) v (4) 4	7·4
28	3448	90	Bh	2−3	7·3*b*
Feb					
4	3455	,,	,,	2−2, 4+6	7·2
7	3458	62	Wf	2−5, 3+2	7·4
8	3459	90	Bh	2−5, 4+4	7·4
11	3462	75	Pr	4+1	7·7
12	3463	90	Bh	2−5	7·5*b*
13	3464	22	Ni	4 (2) v (1) 5	8·3
14	3465	32	Ca	4 (2) v (4) 5	8·0
16	3467	45	Bh	5+2, 6+6	8·2
23	3474	,,	,,	5−1, 6+4	8·5
26	3477	22	Ni	=5	8·5
Mar					
2	3481	90	Bh	4−5	8·3
5	3484	,,	,,	5−3	8·8*b*
6	3485	30	Bn	5 (2) v (1) 7	8·9
9	3488	32	Ca	5 (2) v (1) 6	8·7
13	3492	45	Bh	5−1	8·6
15	3494	22	Ni	=6	8·8
17	3496	75	Pr	5−1	8·6*b*
17	3496	90	Bh	6+1	8·7
17	3496	50	Bn	5 (4) v (1) 7	8·9
18	3497	34	Li	4 (8) v (2) 5	8·3
19	3498	31	D	7 (2) v (3) 9	9·2
21	3500	22	Ni	=9	9·4

Nov. 9, Ni, With 22, 9·9.
Dec. 20, Bn, With B, 6·6.
Jan. 14, With 22, 7·0.
Feb. 11, Orange.
Mar. 13, Yellow.

1923 Mar					
23	3502	32	Ca	6 (2) v (1) 7	
24	3503	34	Li	4 (9) v (1) 5	
25	3504	90	Bh	5−4	
26	3505	50	Bn	5−5, 7+1	
26	3505	31	D	7−3, 9+1	
27	3506	45	Bh	5−6, 6+2	
Apr					
3	3513	94	Ni	9+3	
4	3514	50	Bn	7 (4) v (1) 9	
6	3516	F	Wf	5−5, =7	
6	3516	32	Ca	=8	
7	3517	22	Ni	9 (2) v (5) 10	
8	3518	75	Pr	5−4, 7+2	
8	3518	34	Li	5 (3) v (7) 6	
8	3518	50	Ma	9−1	
8	3518	90	Bh	5−7, 6−3	
10	3520	62	Wf	=7, 9+4	
13	3523	90	Bh	7−1, 9+1	
13	3523	30	Bn	9 (1) v (3) 10	
14	3524	50	Ma	9−1, 10+6	
15	3525	60	D	9 (3) v (2) 10	
16	3526	90	Bh	=9	
20	3530	22	Ni	9 (4) v (3) 10	
20	3530	79	Ma	10+5·5	
20	3530	30	Bn	9 (1) v (2) 10	
22	3532	45	Bh	5−10, 9−3	
23	3533	30	D	9 (2) v (3) 10, 9−5	
26	3536	50	Ma	10+7	
29	3539	90	Bh	9−3, 10+3	
May					
3	3543	,,	,,	10+5	
3	3543	45	Br	9−4, 10+4	
3	3543	50	Bn	9 (4) v (1) 10	10
4	3544	75	Pr	7−2, 10+5	
4	3544	22	Ni	9 (7) v (1·5) 10	10
5	3545	60	D	10+1	10
7	3547	62	Wf	9−4, 10+4	
8	3548	160	Br	10+3	10
9	3549	79	Ma	10+2·5	10
12	3552	34	Li	9 (2) v (8) 10	
12	3552	32	Ca	9 (7) v (2) 10	10
13	3553	30	D	10+0·5	10
13	3553	90	Bh	10+1	10
15	3555	50	Bn	10+1	10
18	3558	94	Ni	10 (3) v (2) 14	11
20	3560	62	Wf	=10, 11+8	10
25	3565	60	D	10−1	10
30	3570	90	Bh	10−4	10
June					
3	3574	62	Wf	10−4, 11+5	10
4	3575	32	Ca	10 (1) v (7) 11	10
6	3577	60	D	10 (3) v (2) 14, 14+5	11
10	3581	,,	,,	10 (3) v (2) 14, 14+6	11
11	3582	90	Bh	10 (2) v (1) 14	11
18	3589	60	D	10 (4) v (1) 14, 14+3	11
21	3592	90	Bh	10 (3) v (1) 14	11
23	3594	,,	,,	14+1	11
23	3594	120	Br	14+2	11
July					
1	3602	62	Wf	=13, 14+2	11
4	3605	94	Ni	14+1	11
5	3606	90	Bh	14−1	11
6	3607	120	Bn	13 (3) v (1) 14	11
6	3607	60	D	14+2	11
9	3610	94	Ni	14−0·5	11

April 15, Not sure.

(5504) S CORONÆ—*continued.*

923						1923					
uly						Oct					
0	3611	157	Wf	14−1, 18+4	11·9	15	3708	94	Ni	10−7	11·0
5	3616	62	,,	13−4, 20+3	12·0	19	3712	90	Bh	9+1	9·3
0	3621	60	D	=18	12·3*b*	20	3713	32	Ca	9 (5) v (4) 10	9·9
0	3621	90	Bh	14−3	12·1	22	3715	75	Pr	6−5, 7 (1) v (1) 9	9·2
2	3623	150	Wf	13−4, 20+4	12·0	22	3715	50	Bn	9−5, 10+3	9·9
7	3628	94	Ni	14 (3) v (1) 20	12·3	25	3718	94	Ni	9 (3) v (5) 10	9·7
1	3632	90	Bh	14−5	12·3	28	3721	62	Wf	5−5, =7	9·0
ug						31	3724	45	Br	5−1	8·6
3	3635	,,	,,	14−5, =18, =20	12·3	Nov					
3	3635	94	Ni	=20	12·4	2	3726	22	Ni	5 (4) v (1) 6	8·7
3	3635	108	Ma	14−2, 20+2	12·1	3	3727	50	Bn	4 (5) v (2) 5	8·3
3	3635	120	Br	=20	12·4	4	3728	30	D	=h	8·1
4	3636	,,	Bn	=18	12·3	4	3728	75	Pr	4−4, 5+2	8·2
6	3638	150	Wf	14−3, 20+3	12·1	5	3729	32	Ca	4 (4) v (3) 5	8·2
9	3641	90	Bh	14−6, 18−1, 20−1	12·4	6	3730	20	Ry	4−2, 5+3	8·1
1	3643	120	Bn	18 (2) v (1) 20	12·4	7	3731	50	Bn	4+1	7·7
1	3643	60	D	<20	<12·4	7	3731	45	Bh	4 (1) v (2) 5	8·0
2	3644	150	Wf	13−5, 18+4	11·9	8	3732	90	,,	=4	7·8
5	3647	90	Bh	14−5, =18, =20	12·3	9	3733	45	,,	4+2	7·6
8	3650	,,	,,	14−4, 18+1, 20+1	12·2	10	3734	90	,,	4+4	7·4
7	3659	,,	,,	14−2	12·0	10	3734	50	Bn	2−5, 4+4	7·4
9	3661	150	Wf	14−2, 18+3	12·0	14	3738	22	Ni	2 (6) v (8) 4	7·3
0	3662	120	Bn	18 (1) v (1) 20	12·3	14	3738	50	Bn	2 (2) v (3) 4	7·3
pt						16	3740	90	Bh	2−2	7·2
1	3664	,,	Br	=18	12·3	16	3740	160	Br	2+1	6·9
1	3664	,,	D	14−4, 18+2	12·2	16	3740	20	Ry	1−2, 2−2, 4+6	7·1
2	3665	94	Ni	14 (4) v (1·5) 20	12·3	17	3741	50	Bn	=2	7·0
5	3668	120	Bn	18+1	12·2	19	3743	,,	,,	=2	7·0
6	3669	79	Ma	18 (1) v (2) 20	12·3	19	3743	90	Bh	2−1	7·1
6	3669	62	Wf	13−1, 18+7	11·6*b*	19	3743	75	Pr	2+1	6·9
6	3669	80	Ca	=20	12·4	23	3747	50	Bn	1 (1) v (1) 2	6·8
6	3669	94	Ni	14 (3) v (3) 20	12·1	30	3754	,,	,,	=1, 2+2	6·7
7	3670	90	Bh	14−2, =18	12·2	Dec					
8	3671	,,	,,	14−3, 18−1	12·3	2	3756	,,	,,	1+1, 2+2	6·7
9	3672	79	Ma	14−2	12·0*b*	2	3756	45	Bh	2+1	6·9
9	3672	75	Pr	14−2, 18+3	12·0	5	3759	,,	,,	2+1	6·9
0	3673	160	Br	18+3	12·0	9	3763	22	Ni	2+2	6·8
1	3674	120	Bn	14 (1) v (2) 18	12·0	9	3763	30	Ry	2−0·5	7·0
1	3674	90	Bh	14−2, 18+1	12·1	11	3765	20	,,	=2	7·0
2	3675	94	Ni	14 (3) v (2) 20	12·2	14	3768	32	Ca	c (3) v (2) 1	6·5
3	3676	90	Bh	14−2	12·0	16	3770	30	Ry	2−1·5	7·1
3	3676	150	Wf	=14, 18+5	11·8	18	3772	45	Br	2+2	6·8
5	3678	120	Bn	14+1	11·7	18	3772	,,	Bh	=2	7·0
6	3679	79	Ma	14+2, 18+5, 20+4	11·8	24	3778	90	,,	2−1	7·1
6	3679	90	Bh	=14	11·8	24	3778	50	Bn	1+1·5, 2+2·5	6·6
1	3684	75	Pr	14−1	11·9*b*	28	3782	90	Bh	=2	7·0
1	3684	90	Bh	10 (3) v (1) 14	11·4	31	3785	20	Ry	2−1·5	7·1
2	3685	,,	,,	14+5	11·3	1924					
6	3689	,,	,,	10 (4) v (2) 14, 10 (5) v (3) 14	11·3	Jan 3	3788	22	Ni	2+2·5	6·7
8	3691	120	Br	14+3	11·5	3	3788	45	Bh	2−5	7·5
9	3692	,,	Bn	11 (2) v (1) 13	11·4	5	3790	,,	,,	2−3	7·3
0	3693	60	D	10 (4) v (1) 14, 14+3	11·5	5	3790	20	Ry	2−2	7·2*b*
0	3693	150	Wf	=13, 14+2	11·6	6	3791	50	Bn	2 (3) v (5) 4	7·3
0	3693	94	Ni	14+4	11·4	7	3792	30	D	2−3, 4+5	7·3
ct						11	3796	45	Bh	2−3	7·3
1	3694	90	Bh	10 (1) v (1) 14	11·0	12	3797	22	Ni	2+1·5	6·8
5	3698	,,	,,	10 (2) v (3) 14	10·9	14	3799	50	Bn	2 (1) v (1) 4	7·4
8	3701	62	Wf	10−5, 11+3	10·8	15	3800	30	D	2−5, 4+3	7·5*b*
9	3702	90	Bh	=10	10·3	16	3801	90	Bh	2−4	7·4
1	3704	,,	,,	10+4	9·9	17	3802	20	Ry	2−5, 4+2	7·5*b*
2	3705	120	Br	10−4	10·7	18	3803	32	Ca	2 (5) v (4) 4	7·4
4	3707	,,	Bn	10 (3) v (1) 11	10·9						
4	3707	32	Ca	10 (7) v (3) 11	10·8						

July 20, D, About.
Sept. 21, Pr, Difficult.

Nov. 6, 16, Dec. 9, 11, 16, 31, Jan 5, 17, Ry, t.
Nov. 19, Pr, Orange, With 4-in. OG, 7·0.
Jan. 7, 4c.

(5504) S CORONÆ—*continued.*

1924					
Jan					
26	3811	45	Bh	2 (1) v (1) 4	7·4
27	3812	20	Ry	2−5, =4	7·6
31	3816	45	Br	2−3, 4+5	7·3
31	3816	,,	Bh	2 (2) v (3) 4	7·3
Feb					
1	3817	22	Ni	2 (8) v (2·5) 4	7·6
1	3817	50	Bn	4+1	7·7
1	3817	30	D	2−6, 4+2	7·6
8	3824	,,	,,	4−1, h+2	7·9
8	3824	22	Ni	4 (1) v (3) 5	8·0
8	3824	62	Wf	4 (1) v (1) 5	8·1
10	3826	30	Ry	4−2·5, 5+1	8·2
14	3830	,,	D	=h	8·1
14	3830	50	Bn	4 (1) v (2) 5	8·0
15	3831	32	Ca	4 (2) v (5) 5	8·0
18	3834	45	Bh	2 (3) v (1) 4	7·6
21	3837	22	Ni	4 (4) v (1) 5	8·3
22	3838	45	Bh	=4	7·8
23	3839	30	Ry	5−1, 6+2	8·6
24	3840	45	Br	4−3, 5+3	8·1
27	3843	,,	Bh	=4	7·8
28	3844	22	Ni	=5	8·5
29	3845	20	Ry	=6, 7+4·5	8·7
29	3845	32	Ca	4 (5) v (2) 5	8·3
Mar					
4	3849	22	Ni	5 (4) v (2) 6	8·7
4	3849	30	D	5−2, 7+3	8·7
4	3849	50	Bn	4 (3) v (2) 5	8·2
6	3851	32	Ca	=5	8·5
7	3852	45	Bh	5+2	8·3
8	3853	30	D	5−2, 7+3	8·7
8	3853	,,	Ry	=6, 7+3·5	8·7
9	3854	45	Bh	5+1	8·4
9	3854	50	Bn	4−5, 5+1	8·3
9	3854	32	Ca	5 (2) v (1) 6	8·7
11	3856	30	D	5−3, 7+2	8·8
12	3857	22	Ni	5 (5) v (1) 6	8·7
14	3859	45	Bh	=5	8·5
18	3863	32	Ca	5 (3) v (3) 7	8·8
19	3864	50	Bn	5 (3) v (2) 7	8·8
26	3871	45	Bh	5−3	8·8
29	3874	90	,,	5 (1) v (2) 9, 5−3	8·8
29	3874	22	Ni	=9	9·4*b*
29	3874	45	Br	5−4, 7+2	8·9
29	3874	50	Bn	9 (2) v (5) 10	9·6
30	3875	32	Ca	6 (3) v (3) 9, =7	9·1
30	3875	30	D	7−3, 9+1	9·3
Apr					
1	3877	50	Bn	9 (1) v (3) 10	9·6
2	3878	30	Ry	7−2, 9−0·5	9·3
2	3878	90	Bh	5−5, 7+1	9·0
4	3880	,,	,,	7−1	9·2
4	3880	50	Bn	9 (2) v (1) 10	10·0
5	3881	32	Ca	7 (1) v (1) 8	9·1
6	3882	90	Bh	5 (2) v (3) 10, =9	9·3
7	3883	50	Bn	9−3, 10+6	9·7
7	3883	60	Kw	=7, 9+4	9·0*b*
11	3887	90	Bh	7 (1) v (1) 9	9·2
11	3887	60	D	9 (3) v (2) 10, 10+5	9·9
12	3888	32	Ca	9 (2) v (7) 10	9·6
14	3890	45	Bh	9+1	9·3
17	3893	94	Ni	9 (4) v (4) 10	9·8

Jan. 27, Feb. 10, 23, 29, Mar. 8, April 2, Ry, t.
Feb. 1, D, 3*b*.
Mar. 29, Ni. Difficult. Unsteady.
April 7, Kw, T.

1924					
Apr					
17	3893	42	Si	=8	
20	3896	90	Bh	=9	
20	3896	50	Bn	9 (2) v (1) 10	1
24	3900	62	Wf	9−5, 10+3	
25	3901	90	Bh	9−2	
26	3902	60	Si	9 (2) v (3) 10	
27	3903	,,	Kw	9−5, 10+2	1
29	3905	94	Ni	10+2·5	1
30	3906	60	Si	9 (2) v (3) 10	
May					
1	3907	,,	Kw	5 (4) v (1) 10, 10+3	
1	3907	79	Ma	10+4	
3	3909	90	Bh	9 (1) v (2) 10	
4	3910	60	D	10+1	1
5	3911	50	Bn	10+1	1
5	3911	79	Ma	10+3·5	
5	3911	90	Bh	10+5	
7	3913	94	Ni	10 (5) v (8) 14	1
7	3913	60	D	=10	1
7	3913	62	Wf	=10	1
8	3914	50	Ry	=10	1
9	3915	30	D	=10	1
9	3915	32	Ca	10 (2) v (6) 11	1
12	3918	62	Wf	10−1	1
13	3919	42	Si	=10	1
13	3919	60	D	10−1	1
14	3920	90	Bh	10+2	1
21	3927	60	D	10 (1) v (5) 14, 10−3	1
22	3928	90	Bh	=10	1
23	3929	60	D	10 (1) v (1) 14, 10−5	1
23	3929	62	Wf	10−4, 11+4	1
24	3930	94	Ni	10 (9) v (4) 14	1
25	3931	32	Ca	10 (7) v (1) 11	1
26	3932	90	Bh	10 (1) v (3) 14	1
26	3932	60	D	10 (2) v (1) 14, 14+5	1
27	3933	,,	Kw	10−1	1
27	3933	42	Si	10 (2) v (3) 11	1
27	3933	50	Bn	10 (3) v (1) 11	1
29	3935	32	Ca	=11	1
30	3936	60	D	10 (3) v (1) 14, 14+3	1
June					
1	3938	,,	,,	10 (3) v (1) 14, 14+3	1
2	3939	62	Wf	10−5, 11+3	1
4	3941	90	Bh	10 (1) v (1) 14	1
8	3945	94	Ni	14+3	1
8	3945	60	Kw	10−3, 11−2, 13+6	1
9	3946	,,	D	14+2	1
13	3950	150	Bh	10 (2) v (1) 14	1
18	3955	90	,,	10 (1) v (1) 14	1
20	3957	50	Bn	11 (3) v (1) 13	1
21	3958	120	D	14−2	1
22	3959	62	Wf	14−1, 19+5	1
23	3960	42	Si	=18	1
23	3960	120	D	14−3, 18+3	1
26	3963	,,	,,	14−3, 18+3	1
26	3963	62	Wf	13−3, 19+4	1
29	3966	120	D	=18	1
30	3967	90	Bh	=14	1
30	3967	62	Wf	13−3, 20+5	1
July					
2	3969	94	Ni	=20	1

April 27, May 1, 27, June 8, Kw, T.
April 29, With 22, 10·2.
May 1, Ma, Pale yellow.
May 8, t.
July 2, Difficult. Unsteady.

(5504) S CORONÆ—*continued.*

3972	120	D	14−4, 18+1	12·2
3973	150	Wf	13−5, 18+2	12·0
3975	94	Ni	14 (5) v (1) 20	12·3*b*
3976	79	Ma	14−0·5	11·9
3976	120	D	18−1, 20+1	12·3*b*
3977	157	Wf	=19	12·4
3978	90	Bh	14−2	12·0
3978	120	Bn	20−1	12·5
3986	,,	,,	20−1·5	12·6
3986	79	Ma	14−1	11·9
3989	62	Wf	=21	12·7
3991	120	Bn	20 (2) v (1) 21	12·6
3991	90	Bh	14−3	12·1
3994	150	Wf	20+1, 19+1	12·3
3996	90	Bh	14−5, =18	12·3
3996	79	Ma	14 (2) v (1) 20	12·2
3996	120	Bn	20 (1) v (1) 21	12·5
3997	94	Ni	18+1, 20−2	12·4
4003	120	Bn	20 (2) v (1) 21	12·6
4003	100	Si	=20	12·4
4003	157	Wf	19−1, =20	12·5
4005	183	Ma	14−4·5, 20+1	12·3
4007	120	D	=20	12·4
4007	90	Bh	14−5, =18	12·3
4013	,,	,,	14−6, 18−2	12·5*b*
4014	120	Br	18−1, 20+1	12·3
4015	,,	D	20−1	12·5
4016	79	Ma	=18	12·3
4017	90	Bh	14−6, 18−2	12·5
4017	120	Bn	=20	12·4
4020	100	Si	14 (2) v (3) 18	12·0
4022	157	Wf	14−5, 19+0·5	12·4
4024	90	Bh	14−5, =18	12·3*b*
4029	120	Bn	14−4, 18+1, 20+2	12·2
4030	157	Wf	14−2, 20+4	12·0
4031	90	Bh	14−2	12·0
4037	,,	,,	14+1	11·7
4038	120	Bn	11−4, 13+1, 14+2	11·5
4038	79	Ma	14−2	12·0*b*
4039	150	Wf	14−1, 18+3	12·0*b*
4041	94	Ni	14−2	12·0
4043	120	Bn	11 (3) v (1) 13	11·4
4045	90	Bh	10 (3) v (1) 14	11·4
4051	120	Bn	11 (3) v (2) 13	11·3
4051	100	Si	=14	11·8
4052	90	Bh	10 (3) v (2) 14	11·2
4055	,,	,,	10 (1) v (1) 14	11·0
4056	150	Wf	10−6, 13+5	10·9
4056	120	Bn	11 (1) v (3) 13	11·2
4057	60	Kw	14+4	11·4*b*
4060	90	Bh	10 (1) v (4) 14	10·6
4064	62	Wf	10−4, 11+5	10·6
4065	90	Bh	=10	10·3
4066	80	Ca	10 (5) v (3) 11	10·8
4067	50	Bn	10 (4) v (1) 11	10·9
4067	120	Br	10−3	10·6
4067	90	Bh	10−1	10·4
4070	,,	,,	=10	10·3

ly 8, Difficult. Unsteady.
ly 9, D, Difficult.
ly 30, Unsteady.
g. 31, t.
pt. 28, T.

1924 Oct					
13	4072	90	Bh	9 (3) v (1) 10	10·0
13	4072	32	Ca	10 (4) v (4) 11	10·7
14	4073	60	Si	=10	10·3
15	4074	90	Bh	10+5	9·8
16	4075	80	Ry	10−1·5	10·4
16	4075	62	Wf	10+3	10·0
17	4076	32	Ca	=10	10·3
17	4076	90	Bh	9 (1) v (3) 10	9·6
17	4076	50	Ry	=10	10·3
19	4078	60	Si	9 (3) v (2) 10	9·9
20	4079	160	Br	9−6, 10+3	10·0
20	4079	32	Ca	10+1	10·2
22	4081	,,	,,	9 (7) v (2) 10	10·1
22	4081	50	Bn	9−6, 10+2	10·0
23	4082	60	Si	9 (2) v (3) 10	9·7
23	4082	40	D	9 (1) v (3) 10, 9−4	9·7
23	4082	94	Ni	9 (5) v (4) 10	9·9
24	4083	32	Ca	9 (2) v (6) 10	9·6
24	4083	90	Bh	=9	9·4
27	4086	45	,,	5 (1) v (1) 9	8·9*b*
28	4087	60	Si	5 (3) v (2) 6	8·6
28	4087	32	Ca	5 (2) v (1) 6	8·7
30	4089	30	Ry	5−3, 6−1·5, 7+3	8·8
31	4090	45	Bh	4 (1) v (1) 5	8·1*b*
31	4090	32	Ca	5 (2) v (2) 6	8·6
Nov					
2	4092	,,	,,	4 (6) v (1) 5	8·4
3	4093	50	Bn	2−7, 4+2	7·6
3	4093	45	Br	4−1·5, 5+5	8·0
3	4093	,,	Bh	=4, 5+5	7·9
4	4094	,,	,,	2 (4) v (1) 4	7·6
4	4094	40	D	4+1	7·7
4	4094	22	Ni	4+2	7·6
7	4097	,,	,,	4+2	7·6
10	4100	45	Bh	2 (2) v (3) 4, 2 (1) v (1) 4	7·3
10	4100	34	Li	2 (2) v (8) 4	7·1
10	4100	50	Bn	2−5, 4+3	7·5
13	4103	30	Ry	3−1, 4+1	7·7
15	4105	45	Bh	2 (1) v (3) 4, 2 (1) v (4) 5	7·2
16	4106	22	Ni	2 (10) v (5) 4	7·5
16	4106	50	Bn	2−3, 4+5	7·3
17	4107	34	Li	=2	7·0
17	4107	60	Si	2 (3) v (2) 3	7·4
20	4110	30	Ry	2−4	7·4
22	4112	32	Ca	=2	7·0
24	4114	45	Bh	2−2	7·2
27	4117	22	Ni	2+2	6·8
27	4117	50	Bn	2−2	7·2
29	4119	32	Ca	1 (2) v (1) 2	6·9
30	4120	60	Si	2 (2) v (3) 3	7·2
Dec					
1	4121	45	Bh	2+3	6·7
3	4123	32	Ca	1 (1) v (1) 2	6·8
4	4124	30	Ry	4+3	7·5
4	4124	45	Bh	2+3	6·7
6	4126	,,	,,	2+2	6·8
6	4126	22	Ni	2+2	6·8
7	4127	32	Ca	c (5) v (1) 1	6·6

Oct. 17, Dec. 4, Ry, t.
Oct. 23, Ni, Unsteady. With 22, 9·9.
Oct. 30, t.
Nov. 3, Br, Orange.
Nov. 4, Ni, Unsteady.
Nov. 13, 20, t.

(5504) S CORONÆ—*continued.*

1924 Dec					
7	4127	50	Bn	1+1, 2+2	6·7
8	4128	60	D	2+1	6·9
14	4134	50	Bn	1+1, 2+2	6·7
14	4134	45	Bh	2+3	6·7
17	4137	60	Si	=2	7·0
17	4137	30	Ry	2−1·5	7·1
19	4139	45	Bh	2+1	6·9
19	4139	60	Si	=2	7·0*b*
20	4140	32	Ca	=c	6·2
22	4142	22	Ni	2+2	6·8

Dec. 8, With B, 6·8.
Dec. 17, Ry, t.

1924 Dec				
22	4142	30	D	=2
24	4144	90	Bh	2+2
24	4144	50	Bn	1 (1) v (1) 2
25	4145	60	Si	2 (2) v (3) 3
28	4148	20	Ry	4+3·5
28	4148	50	Bn	2−0·5
28	4148	90	Bh	=2
31	4151	45	,,	=2
31	4151	60	Si	2 (2) v (3) 3

Dec. 20, Difficult.
Dec. 28, Ry, t.

(5832) W CORONÆ. (V. 6.)

H.D. 161138.

Star A = B.D. + 38° 2739, 9^{m}·5
(reduced to H.C.O. scale from **H.A., 72,** 216).

Date.	Julian Date.	Inst.	Observer.	Comparisons.	Deduced Mag.
1920 Jan					
5	2329	90	Bh	f−7, k+2	10·8
9	2333	,,	,,	f−10, n+8	11·0*b*
16	2340	,,	,,	n+3	11·5
21	2345	,,	,,	n+2	11·6*b*
24	2348	,,	,,	=n	11·8
26	2350	,,	,,	=n	11·8
Feb					
5	2360	,,	,,	n−5, r+5	12·3*b*
10	2365	,,	,,	=r	12·8*b*
11	2366	157	Th	r+4	12·4*b*
15	2370	90	Bh	n−8, r+2	12·6
17	2372	,,	,,	r+2	12·6
18	2373	55	Bg	<o	<12·0*b*
Mar					
4	2388	150	Bh	r−5	13·3
8	2392	157	Th	<r	<12·8*b*
12	2396	150	Bh	r−5	13·3
12	2396	75	Bg	=q	12·5*b*
16	2400	90	Bh	r−2	13·0*b*
18	2402	,,	,,	r+1	12·7*b*
21	2405	,,	,,	r−1	12·9
22	2406	,,	,,	=r	12·8*b*
25	2409	,,	,,	r−2	13·0
31	2415	,,	,,	r−2	13·0*b*
Apr					
9	2424	,,	,,	r+2	12·6
12	2427	,,	,,	n−6, o−4, r+4	12·4
13	2428	157	Th	n (7) v (3) q	12·3*b*

Mar. 4, Glimpsed.
Mar. 8, Not certainly seen.
Mar. 12, Bg, About.
Mar. 22, 31, Difficult.

Date.	Julian Date.	Inst.	Observer.	Comparisons.
1920 Apr				
17	2432	90	Bh	=n
21	2436	,,	,,	n−1
21	2436	75	Bg	n−2, =o
27	2442	90	Bh	k−6, n+2
29	2444	157	Th	l−1, m+4
May				
2	2447	75	Bg	l−1, m+2
4	2449	90	Bh	k−3, n+5
7	2452	,,	,,	k−2, n+6
9	2454	60	D	k−3, l+1
10	2455	55	Bg	k−1, l+1
11	2456	64	Ad	=h
13	2458	90	Bh	n+10
14	2459	60	D	k−2, l+3
17	2462	90	Bh	n+10
19	2464	75	Bg	g−3, k+2
21	2466	45	Bh	c−15, d−4
23	2468	90	,,	c−10
23	2468	64	Ad	=h
23	2468	50	Bn	A (4) v (1) f
26	2471	55	Bg	f+2
June				
1	2477	,,	,,	c−8, f+6
2	2478	45	Bh	c−8
4	2480	,,	,,	c−6
6	2482	64	Ad	c (4) v (1) A
6	2482	50	Bn	c (3) v (1) A
8	2484	90	Bh	c−6
8	2484	30	D	c−5, d+4
9	2485	55	Bg	c−4, f+10
11	2487	30	D	c−3, d+5
15	2491	,,	,,	c−5, d+4
15	2491	90	Bh	c−1
18	2494	45	,,	c−2

(5832) W CORONÆ—*continued.*

2494	50	Bn	b (4) v (1) c	8·5	1921 Jan 30	2720	45	Bh	c−3, f+10	9·0
2495	25	Ad	c (1) v (1) A	9·1	Feb					
2495	30	Bg	c−1	8·7	2	2723	90	,,	c−2	8·8
2498	,,	D	b−5, c+1	8·6	10	2731	,,	,,	c+4	8·2
2499	45	Bh	c+2	8·4	12	2733	45	,,	c+4	8·2
2499	30	Bg	c+2	8·4	17	2738	,,	,,	c+5	8·1
2505	45	Bh	c+2	8·4	21	2742	,,	,,	c+6	8·0
					25	2746	,,	,,	c+6	8·0
2509	30	Bg	c−2	8·8*b*	Mar					
2512	45	Bh	c−1	8·7	2	2751	,,	,,	c+6	8·0
2514	55	Bg	c−2	8·8*b*	2	2751	30	Bg	c+1	8·5
2514	30	D	c−5, d+5	9·0*b*	6	2755	45	Bh	c+5	8·1
2519	55	Bg	c−3, f+11	8·9*b*	9	2758	30	Bg	=c	8·6
2521	45	Bh	=c	8·6*b*	10	2759	45	Bh	c+5	8·1
2522	30	D	c−6, d+3	9·2	14	2763	,,	,,	c+3	8·3
2523	50	Bn	c (1) v (2) A	8·9	16	2765	,,	,,	c+1	8·5
2524	,,	,,	c (1) v (4) A	8·8	18	2767	55	Bg	c−4, f+10	9·0
2530	25	Ad	=A	9·5	21	2770	45	Bh	c−1	8·7*b*
2530	45	Bh	c−4	9·0	24	2773	,,	,,	c−3	8·9
2532	,,	,,	c−6	9·2	24	2773	55	Bg	c−6, f+8	9·2
2536	,,	,,	c−8	9·4	29	2778	45	Bh	c−6, f+8	9·2
2537	55	Bg	c−7, f+7	9·3	30	2779	55	Bg	c−8, f+6	9·4
					Apr					
2543	45	Bh	c−9, g+10	9·5	1	2781	90	Bh	f+3	9·7
2545	90	,,	c−12	9·8	3	2783	30	D	e−2, f+3	9·8*b*
2550	,,	,,	g+3	10·2	7	2787	55	Bg	c−11, f+3	9·7
2552	55	Bg	f+2	9·8	7	2787	45	Bh	f+1	9·9
2552	64	Ad	g (1) v (3) A	10·2*b*	11	2791	30	D	e−4, f+1	10·0*b*
2556	90	Bh	=g	10·5	12	2792	45	Bh	f−4, g+1	10·4
2559	64	Ad	g (1) v (1) h	10·7	15	2795	90	,,	=g	10·5
2559	55	Bg	=f	10·0*b*	23	2803	45	,,	g−4, l+3	10·9
2565	,,	,,	f−2, g+3	10·2*b*	27	2807	90	,,	k−1	11·1
2566	90	Bh	=g	10·5	28	2808	75	Bg	k−1, l+1	11·1
					29	2809	120	Bn	k (r) v (1) l	11·1
2569	,,	,,	g−3	10·8	29	2809	90	Bh	m+1, n+4	11·4
2572	,,	,,	g−4, l+3	10·9	May					
2578	64	Ad	=k	11·0*b*	7	2817	,,	,,	n+2	11·6*b*
2581	150	Bh	l−1, n+5	11·3	8	2818	75	Bg	k−1, l+1	11·1
2584	64	Ad	k (1) v (1) m	11·3*b*	9	2819	120	Bn	l (3) v (1) m	11·5
2586	55	Bg	=l	11·2	14	2824	55	Bg	l−1, m+2	11·3
2587	90	Bh	n+3	11·5	15	2825	90	Bh	=n	11·8
2597	,,	,,	n+1	11·7	23	2833	150	Bn	n−2	12·0*b*
					24	2834	90	Bh	n−5, r+5	12·3
2599	,,	,,	n+2	11·6*b*	25	2835	150	Wf	n−1	11·9*b*
2604	150	Bn	<n	<11·8	28	2838	,,	,,	p−2, r+3	12·5
2607	64	Ad	=n	11·8*c*	28	2838	75	Bg	m−2, n+1	11·7*b*
2616	90	Bh	n−7, r+3	12·5	June					
2623	150	,,	n−7	12·5*b*	5	2846	90	Bh	n−6, r+4	12·4
2628	90	,,	r−1	12·9	7	2848	150	Wf	p−1, q+1	12·4*c*
					7	2848	120	Bn	n (5) v (1) q	12·4*b*
2637	,,	,,	=r	12·8*b*	10	2851	90	Bh	<q	<12·5
2540	45	,,	r+2	12·6	11	2852	64	Ad	<n	<11·8*b*
2659	90	,,	n+1	11·7	23	2864	75	Bg	=o	12·0*b*
					24	2865	90	Bh	r+2	12·6
2671	,,	,,	n+6	11·2	25	2866	231	Wf	p−1, q+1	12·4*c*
2680	,,	,,	g−4, l+3	10·9	30	2871	120	Bn	<n	<11·8
2684	45	,,	g−3, l+4	10·8	July					
					2	2873	75	Bg	=o	12·0*b*
					3	2874	150	Bh	r+2	12·6
2697	,,	,,	f−4, g+1	10·4	7	2878	75	Bg	=q	12·5
2700	90	,,	f+1	9·9	8	2879	150	Wf	n−2	12·0*b*
2703	,,	,,	f+2	9·8	11	2882	90	Bh	r+2	12·6
2714	45	,,	c−10, f+5	9·6*b*						
2717	,,	,,	c−8, f+6	9·4						

ct. 6, Not seen.
ct. 25, r not seen.

April 3, June 10, Not sure.
June 10, Not seen. June 11, Invisible.
June 23, July 2, About.
July 7, About. Difficult.

(5832) W CORONÆ—*continued.*

1921					
July					
14	2885	150	Wf	p−1	12·4*b*
22	2893	,,	,,	m−1, n+2	11·6
25	2896	64	Ad	l (2) v (1) m	11·4
30	2901	62	Wf	l−1, m+2	11·3
31	2902	64	Ad	=l	11·2
Aug					
1	2903	75	Bg	k−2, =l	11·2
6	2908	150	Bh	k−5	11·5
6	2908	62	Wf	k (1) v (1) l	11·1
8	2910	64	Ad	g (4) v (1) k	10·9
8	2910	55	Bg	=k	11·0
15	2917	90	Bh	=h	10·8
18	2920	55	Bg	f+1	9·9
18	2920	64	Ad	g (1) v (2) k	10·7*b*
19	2921	62	Wf	=g	10·5
19	2921	90	Bh	h+3	10·5
29	2931	45	,,	g−1, h+2	10·6*b*
30	2932	90	,,	g+2	10·3
Sept					
4	2937	30	D	e−3, f+2	9·9*b*
5	2938	90	Bh	g+5	10·0
5	2938	75	Bn	A (3) v (1) f	9·9
7	2940	,,	,,	=A	9·5
7	2940	30	Bg	c−6, f+8	9·2
7	2940	64	Ad	A (3) v (1) f	9·9
8	2941	25	,,	A (1) v (1) f	9·8*b*
9	2942	62	Wf	f+2	9·8*b*
10	2943	90	Bh	g+7	9·8
10	2943	75	Bn	c (4) v (1) A	9·3
12	2945	25	Ad	c (4) v (1) A	9·3
15	2948	17	Ad	c (3) v (2) A	9·1*b*
15	2948	30	Bn	=c	8·6
16	2949	90	Bh	c−7, f+7	9·3
21	2954	50	Bn	b (2) v (1) c	8·4
21	2954	90	Bh	c−2	8·8
21	2954	62	Wf	c−1, f+4	9·2*b*
21	2954	30	Bg	c+2	8·4
22	2955	25	Ad	c (1) v (7) A	8·7
23	2956	F	Wf	c−1, d+4	8·9
24	2957	50	Bn	b (1) v (2) c	8·3
25	2958	30	Bg	c+3	8·3
25	2958	25	Ad	c (1) v (7) A	8·7*b*
25	2958	90	Bh	c+1	8·5
27	2960	50	Bn	b+1	8·0
29	2962	,,	,,	a (3) v (1) b	8·0
29	2962	26	Bg	c+4	8·2
30	2963	25	Ad	c−1	8·7*b*
30	2963	45	Bh	c+6	8·0*b*
30	2963	F	Wf	b−4, c+1	8·5
Oct					
1	2964	48	Bg	c+3	8·3
1	2964	45	Bh	c+6	8·0
1	2964	25	Ad	=c	8·6
4	2967	,,	,,	=c	8·6*b*
4	2967	50	Bn	a (2) v (1) b	7·9
5	2968	45	Bh	c+6	8·0
6	2969	48	Bg	c+6	8·0
6	2969	F	Wf	b−2, c+2	8·4
8	2971	50	Bn	a (2) v (1) b	7·9
8	2971	45	Bh	c+6	8·0

July 22, 9-in.
July 30, 6-in.
Aug. 6, Bh, Difficult. Wf, 6-in.
Aug. 19, Wf, 6-in.
Sept. 9, 3-in.
Sept. 21, Wf, 3-in.

1921					
Oct					
9	2972	25	Ad	=c	
16	2979	50	Bn	a (2) v (1) b	
17	2980	45	Bh	c+5	
18	2981	48	Bg	c+3	
21	2984	F	Wf	b−4, c+1	
23	2986	50	Bn	b (1) v (2) c	
23	2986	90	Bh	c+3	
27	2990	,,	,,	=c	
30	2993	50	Bn	b (3) v (1) c	
Nov					
2	2996	62	Wf	c (1) v (1) e	
6	3000	90	Bh	c−6, f+8	
6	3000	50	Bn	c−1	
10	3004	,,	,,	c (4) v (3) A	
12	3006	,,	,,	c (1) v (1) A	
23	3017	,,	,,	A+1	
24	3018	90	Bh	f+2	
Dec					
4	3028	,,	,,	=g	
4	3028	50	Bn	g+2	
15	3039	90	Bh	=k, m+5	
19	3043	,,	,,	=k	
25	3049	,,	,,	n+1	
26	3050	,,	,,	n−2	
28	3052	75	Bn	<k	<k
31	3055	90	Bh	n−3, r+7	
1922					
Jan					
10	3065	,,	,,	n−5, r+5	
18	3073	,,	,,	r+2	
21	3076	,,	,,	r+1	
Feb					
2	3088	,,	,,	=r	
17	3103	,,	,,	r−1	
22	3108	150	Wf	r−3	
26	3112	90	Bh	r−2	
28	3114	231	Wf	r−2	
Mar					
4	3118	90	Bh	r−2	
5	3119	150	Wf	r−2	
10	3124	90	Bh	r+1	
19	3133	,,	,,	r+3	
19	3133	231	Wf	q+1	
22	3136	90	Bh	n−4, r+6	
26	3140	150	Wf	p (1) v (1) q	
28	3142	90	Bh	n−1	
Apr					
2	3147	75	Bg	o−1, q+4	
4	3149	150	Wf	n (1) v (1) o	
4	3149	90	Bh	n+1	
9	3154	,,	,,	k−6, n+2	
14	3159	,,	,,	k−2	
17	3162	,,	,,	k−2, n+6	
19	3164	55	Bg	=l, m+3	
19	3164	62	Wf	k−1, l+2	
29	3174	,,	,,	g−3, k+2	
29	3174	90	Bh	f−8, k+2	
May					
2	3177	45	,,	f−8, k+2	
2	3177	50	Bn	g+1	
4	3179	55	Bg	c−12, f+2	
8	3183	45	Bh	f−2	
12	3187	,,	,,	c−12, f+2	

Oct. 27, Not steady.
Nov. 2, 3-in.
Feb. 28, Very difficult.

(5832) W CORONÆ—*continued.*

922					
ay					
3	3188	55	Bg	c−7, f+7	9·3*b*
3	3188	50	Bn	c−5, A+1	9·3
3	3188	62	Wf	f+4, g+7	9·7*b*
7	3192	90	Bh	c−10, f+4	9·6
9	3194	30	Bn	c (3) v (1) A	9·3
0	3195	55	Bg	c−3, f+11	8·9*b*
1	3196	50	Bn	c (2) v (1) A	9·2
6	3201	45	Bh	c+1	8·5
7	3202	50	Bn	b (4) v (1) c	8·5
8	3203	30	Bg	c+1	8·5
9	3204	F	Wf	c−7, e+3	9·3*b*
1	3206	45	Bh	c+2	8·4
une					
1	3207	55	Bg	c−2	8·8
1	3207	50	Bn	b (2) v (1) c	8·4
4	3210	30	,,	b (3) v (1) c	8·5
1	3217	62	Wf	c−2	8·8*c*
1	3217	25	Ad	c (1) v (4) A	8·8
2	3218	45	Bh	c−2	8·8
2	3218	55	Bg	c−2, f+12	8·8
9	3225	,,	,,	c−1	8·7
2	3228	45	Bh	c−6, f+8	9·2
4	3230	F	Wf	c−5, d+3	9·1*b*
9	3235	45	Bh	c−8, f+6	9·4
ly					
2	3238	62	Wf	e+2, f+6	9·4*c*
0	3246	90	Bh	f+3	9·7
9	3255	55	Bg	=f	10·0*b*
0	3256	64	Ad	g (1) v (3) k	10·7
0	3256	45	Bh	=f	10·0
3	3259	,,	,,	f−3	10·3*b*
3	3259	62	Wf	g−3, k+2	10·8
8	3264	120	Bn	k (1) v (1) l	11·1
0	3266	62	Wf	k (1) v (1) l	11·1
1	3267	55	Bg	k−1, l+1	11·1
1	3267	45	Bh	f−6	10·6
1	3267	64	Ad	k (1) v (1) l	11·1*b*
ig					
7	3274	75	Bg	l−1, m+2	11·3
7	3274	150	Ad	m (2) v (1) n	11·7*b*
1	3278	90	Bh	f−15, n+3	11·5*b*
4	3281	150	Wf	=n	11·8*b*
5	3282	64	Ad	n−0·5	11·9
6	3283	75	Bg	m−1, n+2	11·6
7	3284	90	Bh	=n	11·8
0	3287	,,	,,	n−2, r+8	12·0
0	3287	64	Ad	n−2	12·0*b*
1	3288	150	Wf	=o	12·0
3	3290	64	Ad	n−2	12·0*b*
3	3290	75	Bg	m−2, n+1	11·7
3	3290	90	Bh	n−2, r+8	12·0
5	3292	,,	,,	n−4, r+6	12·2
9	3296	,,	,,	n−3	12·1
1	3298	,,	,,	n−3	12·1
1	3298	75	Bg	=n	11·8*b*
ot					
0	3308	157	Wf	r−1	12·9
5	3313	150	Bh	n−6, r+4	12·4
0	3314	157	Wf	r−2	13·0
0	3318	75	Bg	q−2, r+1	12·7
3	3321	157	Wf	r−4	13·2
9	3327	120	Bn	<n	<11·8
t					
5	3334	90	Bh	<n	<11·8

ug. 7, 20, 23, Ad. Very difficult.
ept. 29, Not seen.

1922					
Oct					
13	3341	231	Wf	r−5	13·3
14	3342	90	Bh	n−6, r+4	12·4
20	3348	,,	,,	<n	<11·8
25	3353	,,	,,	n−8, r+2	12·6
Nov					
1	3360	,,	,,	n−4	12·2
11	3370	157	Wf	r−2	13·0
14	3373	90	Bh	n−2	12·0
18	3377	,,	,,	n−2	12·0
25	3384	,,	,,	n−1	11·9
Dec					
6	3395	,,	,,	<k	<11·0
11	3400	,,	,,	=m, n+3	11·5
17	3406	,,	,,	m+1, n+4	11·4
25	3414	,,	,,	f−10, m+5	11·0*b*
1923					
Jan					
4	3424	,,	,,	f−5, k+5	10·5*b*
11	3431	,,	,,	=f	10·0
27	3447	,,	,,	=f	10·0*b*
Feb					
4	3455	,,	,,	c−10, f+4	9·6
7	3458	62	Wf	f+3, g+6	9·8
8	3459	90	Bh	f+5	9·5
21	3472	48	Bg	c−12, f+2	9·8*b*
23	3474	90	Bh	f+1	9·9
Mar					
2	3481	,,	,,	f−3, g+2	10·3
13	3492	,,	,,	=k	11·0
17	3496	,,	,,	k−1	11·1
18	3497	55	Bg	g−4, k+1	10·9*b*
26	3505	90	Bh	k−3, n+5	11·3*b*
Apr					
6	3516	62	Wf	m−1, n+2	11·6
8	3518	75	Bg	l−2, m+1	11·4*b*
8	3518	120	Bn	<m	<11·5
13	3523	90	Bh	n+2	11·6
14	3524	,,	,,	n−1	11·9
14	3524	75	Bg	=m	11·5
15	3525	150	Wf	m−2, n+1	11·7
20	3530	75	Bg	=n	11·8*b*
22	3532	150	Bh	n−3	12·1
May					
3	3543	90	,,	n−5, r+5	12·3
3	3543	75	Bg	o (4) v (1) q	12·4
7	3547	157	Wf	p−4	12·7
9	3549	90	Bh	=r	12·8
20	3560	157	Wf	=r	12·8
21	3561	90	Bh	r−2	13·0
30	3570	,,	,,	r−2	13·0*b*
June					
3	3574	157	Wf	r−3	13·1
10	3581	OG	Ph	q−5, r−3	13·0
23	3594	90	Bh	=r	12·8*b*
July					
1	3602	157	Wf	o−5	12·5
5	3606	75	Bg	=m	11·5*b*
5	3606	90	Bh	n−7, r+3	12·5
5	3606	OG	Ph	=n, q+6	11·8
10	3611	150	Wf	n−1, o+1	11·9
13	3614	75	Bg	l (1) v (2) m	11·3
15	3616	62	Wf	l−1, m+2	11·3

Oct. 6, 20, Dec. 6, Not seen.
April 8, Bn, t. Not seen.
June 3, Extremely difficult.
July 5, Bg, About.

(5832) W CORONÆ—*continued.*

1923					
July					
20	3621	90	Bh	n−1	11·9
22	3623	150	Wf	k−3, l+1, m+5	11·2
31	3632	90	Bh	=g	10·5*b*
Aug					
2	3634	OG	Ph	f−3, g−1, h+2	10·5
3	3635	90	Bh	f−3, g+2	10·3
3	3635	55	Bg	g (3) v (2) k	10·8
4	3636	OG	Ph	f−3, =g, h+2	10·5
5	3637	55	Bg	g (1) v (4) k	10·6*b*
6	3638	120	Ga	=g	10·5
6	3638	62	Wf	=h	10·8
8	3640	50	Bn	f−4, g+1	10·4
8	3640	OG	Ph	f−1, g+3, h+5	10·2
9	3641	90	Bh	f−2, g+3	10·2
11	3643	55	Bg	c (4) v (1) f	9·7
12	3644	62	Wf	f+1	9·9
15	3647	OG	Ph	f+1, g+3	10·1
15	3647	50	Bn	f (1) v (3) g	10·1
15	3647	90	Bh	c−10, f+4	9·6
18	3650	,,	,,	c−6	9·2
26	3658	45	,,	=c	8·6
28	3660	,,	,,	c+2	8·4
30	3662	50	Bn	a (3) v (2) b	7·9
30	3662	F	Wf	b−2, c+3	8·3
Sept					
2	3665	45	Bh	c+6	8·0
4	3667	,,	,,	c+6	8·0
5	3668	30	Bn	a (2) v (1) b	7·9
6	3669	60	Ga	c+5	8·1
7	3670	45	Bh	c+5	8·1
7	3670	F	Wf	a−2, b+3	7·8
8	3671	30	Bg	b+3, c+8	7·8
11	3674	45	Bh	c+5	8·1
11	3674	25	Bn	a (1) v (2) b	7·8
12	3675	26	Bg	a+1	7·5
13	3676	F	Wf	...	8·2
13	3676	45	Bh	c+6	8·0
16	3679	,,	,,	c+8	7·8
16	3679	25	Bn	a (1) v (1) b	7·8
17	3680	30	Bg	a (1) v (4) b	7·7
21	3684	50	Bn	a (2) v (1) b	7·9
21	3684	45	Bh	c+6	8·0
23	3686	,,	,,	c+6	8·0
26	3689	,,	,,	c+8	7·8
29	3692	25	Bn	a (2) v (1) b	7·9
30	3693	F	Wf	b−1, c+4	8·2
30	3693	45	Bh	c+8	7·8
Oct					
1	3694	,,	,,	c+8	7·8
4	3697	25	Bn	a (3) v (2) b	7·9
5	3698	45	Bh	c+5	8·1
6	3699	60	Ga	c+3	8·3
6	3699	48	Bg	=c	8·6*b*
8	3701	F	Wf	b−3, c+1	8·5
9	3702	45	Bh	c+2	8·4
11	3704	,,	,,	c−1	8·7
14	3707	50	Bn	=c	8·6
19	3712	45	Bh	c−3	8·9
22	3715	48	Bg	c (3) v (4) f, c (2) v (1) d	9·2

Sept. 6, T.
Sept. 12, 5c.
Sept. 13, Wf. Comp. stars used not identified. (A. N. B.)
Sept. 17, 6c.
Oct. 6, Ga, T.

1923					
Oct					
23	3716	45	Bh	c−5	9
24	3717	50	Bn	c−3, e+5	9
26	3719	60	Ga	c−6, f+10	9
26	3719	45	Bh	c−6, f+8	9
28	3721	62	Wf	v (5) f (5) g	9
Nov					
1	3725	45	Bh	c−10, f+4	9
3	3727	50	Bn	f−3, g+2	10
7	3731	90	Bh	f−1, g+4	10
7	3731	50	Bn	f−3, g+2	10
8	3732	OG	Ph	f (1) v (1) k, =g, k+3	10
10	3734	90	Bh	f−2, g+3	10
10	3734	50	Bn	f−4, g+1	10
14	3738	120	,,	=g	10
16	3740	90	Bh	g−1	10
18	3742	120	Bn	g (1) v (1) k	10
30	3754	,,	,,	k−2, m+3	11
30	3754	90	Bh	k−2	11
Dec					
3	3757	120	Bn	l+1	11
4	3758	90	Bh	=m	11
12	3766	150	Wf	n−2	12
21	3775	90	Bh	=n	11
24	3778	,,	,,	<n	<11
1924					
Jan					
2	3787	,,	,,	n (1) v (2) r	12
5	3790	,,	,,	n (2) v (1) r	12
11	3796	,,	,,	=r	12
14	3799	120	Bn	<n	<11
25	3810	90	Bh	<r	<12
Feb					
1	3817	94	Bl	Estimated	<11
8	3824	157	Wf	<r	<12
14	3830	94	Bl	Estimated	<12
22	3838	150	Bh	r−3	13
27	3843	90	,,	=r	12
28	3844	94	Bl	p−3, =q, r+3	12
Mar					
2	3847	90	Bh	=r	12
4	3849	,,	,,	r+1	12
6	3851	94	Bl	o−3, p−2, q+3, r+3	12
8	3853	75	Bg	<o	<12
9	3854	OG	Ph	n (1) v (1) r, o−2	12
9	3854	90	Bh	n (3) v (2) r	12
14	3859	,,	,,	n−4	12
24	3869	75	Bg	=o	12
26	3871	90	Bh	n−2	12
29	3874	,,	,,	n−1	12
29	3874	94	Bl	p−1	12
29	3874	120	Bn	n−3	12
Apr					
1	3877	,,	,,	n−2, q+5	12
2	3878	90	Bh	n+1	12
4	3880	,,	,,	n+2	12
4	3880	120	Bn	n−1, q+6	12
5	3881	OG	Ph	n−2, o+2	12
7	3883	120	Bn	m (2) v (1) n	12
7	3883	75	Bg	m (1) v (2) n	12
7	3883	OG	Ph	m−2, n−5	12
9	3885	120	Bn	m (1) v (1) n	12

Oct. 26, Ga, T.
Dec. 24, Jan. 14, 25, Not seen.
Feb. 8, r extremely difficult.
Mar. 8, Difficult.

(5832) W CORONÆ—*continued.*

1924 Apr					
11	3887	90	Bh	=l	11·2*b*
14	3890	,,	,,	l−2, m+1	11·4
14	3890	94	Bl	l (1) v (4) m	11·3
20	3896	120	Bn	k−2, l+1	11·2
20	3896	90	Bh	m+2	11·3
24	3900	62	Wf	h−2, =k	11·0
25	3901	90	Bh	=g	10·5
25	3901	55	Bg	g (3) v (2) k	10·8*b*
May					
2	3908	,,	,,	c (5) v (2) f	9·6*b*
4	3910	M	Ph	f+2	9·8*b*
5	3911	55	Bg	d (1) v (4) f	9·6
5	3911	45	Bh	f+2	9·8
5	3911	50	Bn	e (3) v (2) f	9·9
5	3911	60	D	e−2, f+2	9·8
7	3913	30	,,	e−3, f+2	9·9
7	3913	62	Wf	f+1	9·9
9	3915	30	D	e−2, f+3	9·8
12	3918	62	Wf	=d, f+4	9·5
13	3919	60	D	=e	9·6
13	3919	94	Bl	e (2) v (2) f	9·8
13	3919	90	Bh	f+4	9·6
16	3922	45	,,	f+3	9·7
16	3922	50	Bn	e+1, f+4	9·6
16	3922	55	Bg	d (1) v (5) f	9·6
21	3927	30	D	e−2, f+2	9·8*b*
22	3928	45	Bh	=f	10·0
23	3929	60	D	e (5) v (1) f	10·0
24	3930	94	Bl	e (2) v (2) f	9·8
25	3931	62	Wf	v (2) f (8) h	9·8
26	3932	30	D	=f	10·0
26	3932	90	Bh	f+2	9·8
27	3933	,,	,,	f+3	9·7
27	3933	50	Bn	f+1	9·9
28	3934	55	Bg	d (1) v (3) f	9·6*b*
30	3936	60	D	=f	10·0
June					
1	3938	,,	,,	=f	10·0
2	3939	62	Wf	f+1, g+5	10·0
3	3940	94	Bl	e (2) v (2) f	9·8
5	3942	55	Bg	d (2) v (3) f	9·7
9	3946	60	D	f−3, g+3	10·3
13	3950	90	Bh	f−2, g+3	10·2
16	3953	94	Bl	f (4) v (1) g	10·4
18	3955	90	Bh	g−1	10·6*b*
21	3958	60	D	=h	10·8
22	3959	62	Wf	h (1) v (1) k	10·9
23	3960	75	Bg	g (4) v (1) k	10·9
24	3961	45	Bh	f (2) v (1) m	11·0*b*
26	3963	60	D	h−2, k+1	11·0
26	3963	62	Wf	=k	11·0
29	3966	94	Bl	h−1, k+2	10·9
30	3967	62	Wf	k−2	11·2
30	3967	75	Bg	k (1) v (2) l	11·1*b*
30	3967	90	Bh	k−1	11·1*b*
July					
6	3973	94	Bl	k−5, l+1, m+4	11·3
6	3973	150	Wf	k−7, l−2, m+1	11·5

May 13, Bl, With 22, 10·2.
May 24, With 22, 10·1.
June 3, With 22, 9·9.

1924 July					
7	3974	75	Bg	l (1) v (2) m	11·3
9	3976	120	D	=l	11·2*b*
10	3977	157	Wf	=m, n+2	11·6
12	3979	94	Bl	l−0·5	11·3*b*
19	3986	75	Bg	m (1) v (1) n	11·7*b*
22	3989	157	Wf	n−1, o+1	11·9
26	3993	94	Bl	o−2, q+6, r+6	12·1
27	3994	150	Wf	n−5, o−3	12·3
29	3996	90	Bh	n−2	12·0
29	3996	120	Bn	n−2	12·0
Aug					
2	4000	90	Bh	n (3) v (1) r	12·5
6	4004	157	Wf	q+1	12·7
7	4005	75	Bg	=o	12·0*b*
9	4007	94	Bl	q−2, =r	12·7*b*
9	4007	90	Bh	n (3) v (1) r	12·5*b*
17	4015	120	D	<n	<11·8
19	4017	75	Bg	<o	<12·0
19	4017	150	Bn	<q	<12·5
19	4017	90	Bh	r−2	13·0
22	4020	157	Wf	r−2	13·0
24	4022	,,	,,	r−3	13·1
Sept					
2	4031	,,	,,	r−6	13·4
2	4031	90	Bh	r−4	13·2
23	4052	150	,,	r−5	13·3
26	4055	157	Wf	r−6	13·4
26	4055	90	Bh	r−3	13·1
Oct					
1	4060	,,	,,	r−3	13·1
5	4064	157	Wf	r−5	13·3
8	4067	75	Bg	<q	<12·5*b*
8	4067	90	Bh	r−1	12·9
15	4074	,,	,,	=r	12·8
17	4076	231	Wf	r−0·5	12·8
23	4082	120	Bn	<m	<11·5
24	4083	90	Bh	n (1) v (1) r	12·3
Nov					
1	4091	45	,,	h+3	10·5
4	4094	150	Bn	<m	<11·5
10	4100	94	Bl	Estimated	<11·4
16	4106	90	Bh	g−1	10·6
16	4106	94	Bl	=l	11·2
17	4107	120	Bn	k (2) v (1) l	11·2
27	4117	,,	,,	k−0·5	11·1
Dec					
1	4121	90	Bh	f−3, g+2	10·3
4	4124	45	,,	=f	10·0
7	4127	50	Bn	f−3, g+2	10·3
12	4132	90	Bh	f+5	9·5*b*
14	4134	45	,,	c−8, f+6	9·4
14	4134	50	Bn	c (7) v (1) d	9·4
19	4139	45	Bh	c−3	8·9*b*
24	4144	90	,,	c−1	8·7
28	4148	45	,,	c+2	8·4
28	4148	50	Bn	b−5, c+1	8·6
31	4151	45	Bh	c+2	8·4

July 9, Difficult.
Sept. 2, 26, Wf, Difficult.
Oct. 5, Extremely difficult.
Nov. 1, 16, Bh, Doubtful. (A.N.B.).

(7120) χ CYGNI.

H.D. 194632.

Star D = B.D. + 30°3857, 5m·44, **H.A., 50,** 170.
,, R = ϕ Cygni, 4·74, ,, **45,** 244.
,, S = B.D. + 34°3590, Fl. 8 Cygni, 4·90 ,, **45,** 242.
,, μ, $\Delta\alpha$ − 8s, $\Delta\delta$ + 1′·7, estimated by Nijland 13m·41.

Date.	Julian Date.	Inst.	Observer.	Comparisons.	Deduced Mag.
1920 Jan					
5	2329	90	Bh	107−3	13·1*b*
9	2333	94	Ni	μ−1·5	13·6
15	2339	240	Br	<κ	<13·2*b*
19	2343	79	Ma	<104	<12·7
21	2345	130	Bo	=101	12·5*b*
21	2345	150	Bn	<98	<12·5
23	2347	94	Ni	μ−2·5	13·7
24	2348	240	Br	λ−2	13·6
24	2348	250	Th	λ−3	13·7*b*
31	2355	157	,,	<104	<12·7
Feb					
8	2363	,,	,,	< (104−3)	<13·0*b*
10	2365	90	Bh	104−2, =107	12·8
12	2367	,,	,,	92−5, 97−2, =104	12·6
14	2369	94	Ni	107 (3) v (3) μ	13·1
15	2370	90	Bh	94−3	12·6
16	2371	130	Bo	92 (3) v (1) 101	12·4
17	2372	90	Bh	94−1	12·4*b*
22	2377	94	Ni	92 (4) v (2) 107	12·6
23	2378	130	Bo	=92	12·2
23	2378	90	Bh	87−3, 94+1	12·2
27	2382	94	Ni	92 (5) v (1) 107	12·7
28	2383	160	Bo	87 (3) v (1) 92	12·1
29	2384	90	Bh	=92, 104+5	12·2*b*
Mar					
4	2388	160	Bo	87 (1) v (2) 92	12·0
6	2390	120	Bn	87 (1) v (1) 92	12·1
7	2391	90	Bh	87−2	12·1
12	2396	,,	,,	87+1	11·8
12	2396	55	Bo	67 (3) v (1) 76	11·5
15	2399	94	Ni	67 (2) v (2) 87	11·6
18	2402	90	Bh	87+2	11·7
19	2403	130	Bo	64 (1) v (1) 67	11·2
19	2403	120	Bn	87+3	11·6*b*
22	2406	94	Ni	62 (4) v (2) 67	11·2
25	2409	55	Bo	62 (1) v (3) 64	11·0
25	2409	90	Bh	62−6, 87+3	11·6
28	2412	94	Ni	=62	11·0
30	2414	55	Bo	51 (1) v (3) 56	10·6
31	2415	90	Bh	51−5, =56, 62+1	10·9
Apr					
6	2421	55	Bo	36 (4) v (1) 51, 34 (3) v (1) 41	10·4
9	2424	90	Bh	27−3, =34	10·1*b*
11	2426	45	,,	27−2	10·1
1920 Apr					
13	2428	60	D	=51	10·5
16	2431	94	Ni	20 (6) v (2) 34	9·9
16	2431	62	Th	27 (1) v (1) 58	10·4
17	2432	90	Bh	20−3, =27, 34+3	9·8
20	2435	22	Ni	=34	10·1
21	2436	160	Br	27−2, 51+4	10·1
21	2436	90	Bh	20−1, 27+3	9·5
21	2436	62	Th	27−2	10·1
21	2436	60	D	27−3, 51+3	10·2
27	2442	90	Bh	20−2, 27+3	9·6
May					
2	2447	79	Ma	20 (4) v (1) 27	9·8
4	2449	94	Ni	20 (3) v (3) 34	9·7
4	2449	45	Bh	20−2, 27+2	9·6
7	2452	90	,,	20−2, 27+2	9·6
7	2452	60	D	20−3, 27+2	9·7
7	2452	45	Br	=20	9·4
9	2454	22	Ni	20 (2) v (2) 34	9·7
9	2454	62	Th	=20	9·4
10	2455	30	D	20−3, 27+3	9·6
12	2457	90	Bh	13−6, 20+1	9·3
12	2457	22	Ni	20 (2) v (2) 34	9·7
13	2458	75	Bn	13 (4) v (1) 18	9·2
14	2459	90	Bh	13−1, 20+5	8·8
17	2462	,,	,,	7−5, 20+5	8·8
18	2463	30	D	20−0·5	9·4
19	2464	50	Bn	7 (5) v (1) 13	8·6
21	2466	,,	,,	7 (2) v (1) 13	8·5
21	2466	45	Bh	7−1, 13+3	8·3
21	2466	22	Ni	=13	8·7
22	2467	45	Br	6−3, 7+3	7·8
22	2467	50	Ma	=7	8·1
23	2468	90	Bh	6−4, 7+2	7·9
23	2468	22	Ni	7 (4) v (2) 13	8·5
23	2468	45	Th	=7	8·1
25	2470	90	Bh	6−3, 7+3	7·8
25	2470	30	D	7−2, 9+1	8·3
28	2473	22	Ni	7 (2·5) v (3) 13	8·4
28	2473	62	Th	6 (1) v (1) 7	7·8
29	2474	50	Bn	6 (1) v (2) 7	7·7
29	2474	45	Bh	3−8, 6+3	7·2
June					
2	2478	,,	,,	3−7, 6+3	7·2
3	2479	50	Ma	6+2	7·3

Jan. 5, κ not seen.
Jan. 15, 31, Not seen.
Jan. 19, Invisible.
Jan. 24, Br, About. Glimpsed. Th, Very difficult.
Feb. 8, Not certainly seen.

April 16, Ni, With 22, 10·3.
May 2, Reddish.
May 4, Ni, With 22, 10·0.
May 23, Bh, Deep orange. Th, 12¼-in. spec at Headley.
May 29, Bh, Crimson.

(7120) χ CYGNI—*continued.*

1920					
June					
4	2480	45	Bh	3−3, 6+9	6·7
5	2481	,,	Br	3−1	6·5
5	2481	F	Mn	4 (1) v (2) 5	7·0*c*
6	2482	,,	Bn	n (1) v (4) 6	7·1
7	2483	B	Ma	3 (1) v (1) o	6·9
8	2484	,,	,,	2−6, 3−3, o+6	6·7*b*
8	2484	45	Bh	3−3	6·7
8	2484	30	D	3−1, 4+3	6·5
8	2484	22	Ni	3 (2) v (6) o	6·6
9	2485	F	Bn	3 (1) v (2) n	6·6
11	2487	30	D	2+1	6·0
11	2487	B	Mn	2 (3) v (1) 3	6·3*b*
13	2489	,,	,,	g (1) v (1) 2, 2+3	5·8
13	2489	,,	Ma	1 (2) v (1) 3, 2+2	5·9
15	2491	45	Bh	1−7, 2+2	5·8
15	2491	B	D	g−2, 2+3	5·8
15	2491	F	Th	g+3, 2+3	5·5*b*
17	2493	B	Mn	1 (3) v (1) g, g+1·5	5·4
18	2494	F	Bn	1 (3) v (1) g	5·4
18	2494	45	Bh	1−7, 2+3	5·8
19	2495	B	Br	1−2, g+3	5·3
19	2495	,,	D	1−3, g+2	5·4
19	2495	,,	Mn	1 (1) v (1) g	5·3
22	2498	,,	D	1−1, g+4	5·2
22	2498	,,	Ma	1−2	5·3
23	2499	,,	,,	1−1	5·2
23	2499	,,	Br	=1	5·1*b*
23	2499	45	Bh	=1, 2+10	5·1
23	2499	B	Mn	=1	5·1
25	2501	,,	,,	1−0·5	5·1
26	2502	,,	Br	=1	5·1
29	2505	,,	,,	=1	5·1
29	2505	F	Bh	=1, g+5	5·1*b*
29	2505	B	Mn	1 (1) v (3) g	5·2*b*
30	2506	,,	D	R−3, 1+2	5·0
July					
3	2509	,,	Mn	1 (1) v (3) g	5·2
6	2512	45	Bh	1−2, 2+8	5·3
8	2514	B	D	R−3, 1+1	5·0
8	2514	,,	Ma	1+3	4·8
8	2514	,,	Ni	D (1) v (4) g	5·5
9	2515	,,	,,	=D	5·4
9	2515	B	D	1−1, g+5	5·1
11	2517	,,	,,	1−1, g+3	5·2
11	2517	,,	Ni	=D	5·4
12	2518	,,	D	1−1, g+4	5·2*b*
12	2518	,,	Ma	1 (3) v (2) h	5·5
14	2520	,,	D	1−3, g+2	5·4*b*
14	2520	,,	Bn	1 (3) v (1) g	5·4
14	2520	,,	Mn	1 (3) v (7) g	5·2
14	2520	,,	Ni	D (3) v (1) g	5·5
15	2521	45	Bh	1−3, 2+6	5·4
15	2521	B	D	1−4, g+2	5·4
15	2521	,,	Ma	1 (1) v (9) h	5·1
16	2522	,,	Ni	D (3) v (2) g	5·5
17	2523	,,	Br	1−1	5·2
17	2523	,,	D	1−3, g+2	5·4
17	2523	,,	Mn	1 (1) v (4) g	5·2
18	2524	,,	D	1−4, g+1	5·5
18	2524	,,	Bn	1 (3) v (1) g	5·4
1920					
July					
18	2524	B	Ma	1 (1) v (9) g, 1−2	5·1
19	2525	45	Bh	1−5, 2+5	5·6*b*
19	2525	B	Ni	D (4) v (1) g	5·5
20	2526	,,	Th	g+2	5·4*b*
20	2526	,,	D	=g	5·6
22	2528	,,	,,	=g	5·6
24	2530	,,	Mn	1 (3) v (1) g	5·4
24	2530	,,	Bn	1 (7) v (1) g	5·5
24	2530	,,	Ni	g (3) v (3) 3	6·0
24	2530	,,	Ma	1 (3) v (2) h	5·5
26	2532	,,	,,	1 (2) v (1) h	5·5
26	2532	45	Bh	=g, 2+5	5·6*b*
26	2532	B	Br	1−3, g+2	5·4
27	2533	,,	D	g−3, 2+2	5·9
27	2533	,,	Ni	g (3) v (3) 3	6·0
28	2534	,,	Ma	1 (3) v (1) h	5·6
30	2536	45	Bh	1−7, 2+3	5·8
31	2537	B	Br	=g	5·6
Aug					
1	2538	,,	D	g−3, 2+3	5·8*b*
1	2538	,,	Ma	1 (9) v (1) h	5·7
1	2538	,,	Mn	1 (4) v (1) g	5·5*b*
2	2539	,,	Br	g−3, 2+2	5·9*b*
3	2540	,,	D	g−4, 2+2	5·9
3	2540	,,	Ma	1 (9) v (1) h, h+1	5·6
3	2540	,,	Ni	g (4) v (1·5) 3	6·2
4	2541	,,	,,	g (5) v (1) 3	6·3
5	2542	,,	Ma	h+1, 3+4	5·8
6	2543	,,	Br	g−3, 2+2	5·9
6	2543	45	Bh	2+5, 3+10	5·5
6	2543	B	D	=2	6·1*b*
7	2544	,,	,,	2−1, 3+2	6·2
7	2544	,,	Ma	=h	5·7
7	2544	,,	Bn	2 (2) v (1) 3	6·3*b*
9	2546	,,	Ma	h (1) v (1) 2	5·9
10	2547	,,	D	2−4, 3+2	6·3
10	2547	,,	Ma	h−1	5·8
12	2549	,,	Br	2−2, 3+1	6·3
13	2550	,,	Mn	2 (1) v (2) 3	6·2*b*
13	2550	45	Bh	2−2, 3+2	6·2
15	2552	B	Bn	3 (3) v (1) n	6·8
15	2552	,,	Ma	2−1	6·2
16	2553	23	Bo	2 (3) v (1) 3	6·3
17	2554	B	Ma	2 (1) v (1) 3	6·2
19	2556	,,	,,	2+0·5	6·0
19	2556	,,	Br	=3	6·4
20	2557	45	Bh	=3	6·4
20	2557	B	Ma	2 (4) v (1) 3	6·3
20	2557	,,	Mn	3 (1) v (2) 4	6·5*b*
22	2559	,,	Bn	n+1·5	6·8
22	2559	F	Th	3−2·5	6·7
23	2560	B	Ma	3−1	6·5
25	3562	,,	D	3−5	6·9*b*
26	2563	45	Bh	2−6, 3−3	6·7*b*
26	2563	B	Mn	3 (3) v (1) 4	6·7
26	2563	50	Ma	6+6, 7+8	7·1
29	2566	,,	,,	6+4, 7+8	7·2

June 4, Orange red.
June 8, D, With B, 6·8.
June 11, D, With B, 6·2.
June 23, Br, About.
July 8, Ma, Orange tint.

July 24, Aug. 1, Ma, In 79, very pale orange.
Aug. 5, In T, more pronounced orange than on Aug. 1.
Aug. 7, Ma, In 79, orange.
Aug. 9, In 79, warm orange.
Aug. 23, In T 50, Pale orange.
Aug. 25, Difficult.

(7120) χ CYGNI—*continued.*

1920						1920					
Sept						Oct					
1	2569	50	Ma	6+2, 7+5	7·5	12	2610	90	Bh	7−8, 20+4	9·0
4	2572	30	Bn	6+2	7·3*b*	12	2610	30	Tn	=11	8·7
4	2572	B	Mn	=5	7·4	14	2612	48	Wi	=20	9·4
4	2572	45	Bh	3−5, 6+5	7·0	14	2612	23	Bo	13 (1) v (2) 16	8·8
6	2574	90	,,	6+3	7·2	17	2615	22	Ni	20 (2) v (3) 34	9·7
6	2574	22	Ni	0 (5) v (1·5) 6	7·5	18	2616	45	Br	7−3, 13+3	8·4
6	2574	50	Ma	6+1, 7+3	7·6	18	2616	50	Ma	=20	9·4
8	2576	23	Bo	5 (1) v (2) 6	7·4	20	2618	55	Bo	=16	9·0
8	2576	30	D	=6	7·5*b*	20	2618	50	Bn	13 (3) v (1) 18	9·1
8	2576	,,	Tn	3 (8) v (2) 6	7·3	20	2618	B	Mn	=16	9·0*b*
10	2578	50	Ma	6+1, 7+3	7·6	22	2620	45	Bh	=20	9·4
10	2578	22	Ni	6 (2) v (1·5) 7	7·9	23	2621	50	Ma	18 (1) v (1) 20	9·3
10	2578	B	Mn	5 (4) v (1) 6	7·5	23	2621	94	Ni	20 (1·5) v (4) 34	9·6
11	2579	48	Wi	=6	7·5	24	2622	50	Bn	18 (2) v (3) 27	9·5
11	2579	30	Bn	6 (1) v (2) 7	7·7	25	2623	55	Bo	18 (1) v (1) 20	9·3
11	2579	,,	D	6−1	7·6	25	2623	90	Bh	20−4, =27, 34+4	9·8
12	2580	23	Bo	6 (1) v (2) 7	7·7	25	2623	60	Tn	20−1	9·5
12	2580	45	Br	6+2	7·3	25	2623	50	Ma	20 (5) v (1) 27, 18−1	9·7
12	2580	90	Bh	=6	7·5	26	2624	,,	,,	20+1	9·3
13	2581	50	Ma	6+1, 7+3	7·6	28	2626	,,	,,	20 (2) v (1) 27	9·7
13	2581	30	Tn	3 (9) v (1) 6, 6+2	7·4	28	2626	32	Mn	20 (1) v (2) 27, =24	9·6
15	2583	,,	,,	=6	7·5	29	2627	55	Bo	18 (3) v (1) 20	9·4
16	2584	90	Bh	6−2, 7+4	7·7	29	2627	90	Bh	34+2	9·9
16	2584	B	Mn	6 (1) v (2) 7	7·7*b*	30	2628	160	Br	20−2, 27+3	9·6
16	2584	48	Wi	=6	7·5	30	2628	50	Bn	18 (4) v (1) 27	9·8
16	2584	50	Ma	6+1, 7+2·5	7·7	30	2628	79	Ma	20 (3) v (1) 27	9·8
18	2586	,,	,,	6 (1) v (2) 7	7·7	30	2628	48	Wi	=27	9·9
18	2586	48	Wi	=7	8·1*b*	Nov					
19	2587	23	Bo	6 (1) v (2) 7	7·7	1	2630	30	D	27−4, 51+2	10·3
19	2587	30	D	6−4, 7+2	7·9	1	2630	50	Ma	20 (4) v (1) 27	9·8
19	2587	22	Ni	7 (3) v (3) 13	8·4	1	2630	94	Ni	20 (5) v (2) 34	9·9
19	2587	30	Tn	=6	7·5	1	2630	48	Wi	=27	9·9
21	2589	,,	,,	6−1	7·6	4	2633	50	Bn	27 (2) v (1) 34	10·1
22	2590	90	Bh	6−2, 7+4	7·7	4	2633	55	Bo	20 (1) v (2) 27	9·6
23	2591	22	Ni	7 (4) v (2·5) 13	8·5	8	2637	,,	,,	27 (1) v (3) 34	9·9
26	2594	45	Br	6−2, 7+4	7·7	9	2638	90	Bh	34−2, 51+3	10·3*b*
26	2594	,,	Bh	=6	7·5*b*	9	2638	94	Ni	34 (3) v (3) 51	10·3
27	2595	32	Mn	6 (3) v (2) 7	7·9*b*	11	2640	79	Ma	27 (1) v (1) 51	10·2
28	2596	30	Tn	6 (8) v (2) 7	8·0*b*	13	2642	90	Bh	34−3, 51+1	10·4
29	2597	23	Bo	9 (3) v (1) 13	8·6*b*	16	2645	55	Bo	=58	10·9
29	2597	90	Bh	6−3, 7+3	7·8	17	2646	160	Br	51+1	10·4*b*
29	2597	50	Ma	=7	8·1	17	2646	79	Ma	58 (3) v (1) 62	11·0
29	2597	B	Mn	9+1	8·3*b*	18	2647	,,	,,	51 (1) v (3) 56, =58	10·7
30	2598	30	Tn	6 (8) v (2) 7	8·0*b*	18	2647	32	Mn	51 (1) v (3) 59	10·6*b*
Oct						21	2650	79	Ma	=51, 62+1	10·7
1	2599	22	Ni	7 (6) v (1) 13	8·6	21	2650	160	Bo	54 (3) v (1) 58	10·9
2	2600	48	Wi	=14	9·0	21	2650	90	Bh	=59, =58, 62+2	10·8
2	2600	50	Bn	7 (2) v (1) 13	8·5	21	2650	150	Tn	=62	11·0*b*
3	2601	30	D	=9	8·4*b*	22	2651	94	Ni	51+3, 62+3, 67−3	10·9
4	2602	23	Bo	9 (1) v (3) 13	8·5	30	2659	90	Bh	62−1, 67+1	11·2
5	2603	30	D	9−4, 14+2	8·8	Dec					
6	2604	90	Bh	7−2	8·3	1	2660	160	Bo	67 (1) v (3) 64	11·4
7	2605	45	Br	=7	8·1	1	2660	,,	Br	=67	11·3
8	2606	22	Ni	13 (1·5) v (1·5) 20	9·2	1	2660	150	Tn	62−1	11·1
9	2607	23	Bo	9 (3) v (1) 13	8·6	2	2661	94	Ni	62 (7) v (1) 67	11·3
9	2607	45	Bh	7−6, 20+6	8·8	3	2662	79	Ma	51−2·5, 74+3·5	11·0
9	2607	50	Ma	7 (2) v (1) 20	9·0	4	2663	150	Tn	62 (5) v (5) 75	11·3
10	2608	30	D	=20	9·4	8	2667	,,	,,	=75	11·5
11	2609	50	Bn	13 (2) v (1) 18	9·1	8	2667	90	Bh	75−1, 87+3	11·6
11	2609	,,	Ma	7 (2) v (1) 20	9·0	9	2668	120	Bn	59 (3) v (1) 74	11·4
11	2609	32	Mn	9 (3) v (1) 13	8·6	9	2668	79	Ma	63 (1) v (1) 64, =85	11·3

Sept. 1, Pale orange.
Sept. 6, Ma, Reddish orange.
Sept. 18, Ma, Pale orange red.
Sept. 29, Ma, Dull red.
Oct. 9, Ma, Dull reddish.

Oct. 18, Ma, Dull red.
Oct. 23, Ni, With 22, 10·1.
Oct. 25, Ma, Reddish.
Nov. 1, Ni, With 22, 10·3.
Dec. 9, Ma, Very difficult.

(7120) χ CYGNI—*continued.*

1920 Dec					
12	2671	60	Mn	67 (2) v (1) 87	11·7*b*
12	2671	90	Bh	=75, 87+2	11·6
16	2675	183	Ma	62 (9) v (1) 92, 74+1	11·9
21	2680	60	Mn	=87	11·9*c*
22	2681	160	Bo	74 (1) v (1) 87	11·8
22	2681	150	Tn	74 (5) v (5) 92	11·9
26	2685	90	Bh	87−2, 92+1	12·1
27	2686	120	Br	87−1, 97+2	12·0
27	2686	150	Tn	92−1	12·3
28	2687	183	Ma	87 (1) v (1) 92	12·1
31	2690	90	Bh	=92, 97+1	12·1
1921 Jan					
1	2691	150	Tn	=94	12·3*b*
4	2694	,,	,,	=98	12·5
6	2696	90	Bh	87−4, =97, 107+4	12·3
7	2697	183	Ma	87−3, 92−5	12·5
13	2703	150	Tn	98 (5) v (5) 107	12·6
13	2703	90	Bh	92−3, 97−1	12·4
14	2704	240	Br	104−1	12·8
14	2704	183	Ma	87−7, 92−5	12·7
15	2705	130	Mn	92−2	12·4*b*
16	2706	160	Bo	=92	12·2*b*
16	2706	94	Ni	=107	12·8
16	2706	150	Tn	=107	12·8*b*
19	2709	183	Ma	<92	<12·2
21	2711	90	Bh	=107	12·8
Feb					
4	2725	160	Bo	=107	12·8*b*
9	2730	90	Bh	<101	<12·5
17	2738	,,	,,	101−5, =107	12·9*b*
19	2740	160	Bo	107 (1) v (1) κ	13·0*b*
21	2742	90	Bh	101−6, 107−2	13·0
28	2749	130	Mn	107−3	13·1*b*
Mar					
2	2751	94	Ni	μ−1	13·5
2	2751	160	Bo	=κ	13·2*c*
6	2755	90	Bh	107−2	13·0
9	2758	94	Ni	=μ	13·4*b*
11	2760	90	Bh	97−5	12·7*b*
15	2764	160	Bo	107 (4) v (1) κ	13·1
18	2767	90	Mn	110−1	13·2*b*
18	2767	94	Ni	μ+1	13·3
24	2773	90	Bh	...	<13·0
29	2778	,,	,,	107−1	12·9
30	2779	160	Bo	107 (1) v (3) κ	12·9
Apr					
1	2781	94	Ni	=107	12·8
1	2781	90	Bh	92−3, 97−1	12·4
4	2784	120	Bn	=94	12·3*b*
4	2784	130	Mn	109−1	13·0
6	2786	94	Ni	92 (5) v (1) 107	12·7
7	2787	90	Bh	=97, =94	12·3*b*
9	2789	,,	,,	92−1, =94	12·3
15	2795	94	Ni	92 (3) v (3) 107	12·5
15	2795	120	Br	104−1, 107+1	12·7*b*
19	2799	90	Bh	87−1	12·0
27	2807	,,	,,	=87	11·9
27	2807	94	Ni	87 (1) v (2) 92	12·0*b*
28	2808	120	Br	87−1	12·0
28	2808	,,	Bn	87 (1) v (3) 92	12·0
29	2809	150	Bh	87+1, 97+3	11·9*b*
1921 May					
3	2813	94	Ni	67 (3) v (1·5) 87	11·7
7	2817	90	Bh	75−2, 87+2	11·7
9	2819	,,	,,	=75, 87+3	11·6
9	2819	120	Bn	76+1	11·4
10	2820	160	Bo	64 (3) v (1) 67	11·3
15	2825	90	Bh	62−2, 74+4	11·2*b*
19	2829	94	Ni	62 (4) v (3) 67	11·2
20	2830	55	Bo	53 (3) v (1) 58	10·9
21	2831	45	Bh	=62	11·0*b*
23	2833	120	Bn	59 (3) v (1) 67	11·2
24	2834	90	Bh	=58, =62	11·0
24	2834	94	Ni	62 (4) v (4) 67	11·2
29	2839	60	D	56−2, 64+1	11·0
31	2841	30	,,	56−1, 64+2	10·9
June					
1	2842	55	Bo	=51	10·5
1	2842	160	Br	51−4, 67+4	10·9
1	2842	94	Ni	62 (4) v (3) 67	11·2
2	2843	90	Bh	=51, =55	10·7
5	2846	,,	,,	=51, =55	10·7
5	2846	60	D	56−2, 64+2	11·0
6	2847	94	Ni	62 (2) v (5) 67	11·1
7	2848	50	Bn	34 (2) v (1) 51	10·4
7	2848	79	Ma	=51	10·5
9	2850	48	Wi	51−3, 62+2	10·8
10	2851	90	Bh	34−2	10·3
11	2852	50	Ma	27−1	10·0
11	2852	48	Wi	51−3, 62+2	10·8
14	2855	55	Bo	27 (3) v (1) 34	10·0
15	2856	90	Bh	=34	10·4
16	2857	60	D	27−5, 51+1	10·4*b*
21	2862	90	Bh	27−1, 34+2	9·9
23	2864	50	Bn	18 (4) v (1) 27	9·8
24	2865	94	Ni	20 (3) v (3) 34	9·7
24	2865	60	D	27−3, 51+3	10·2
24	2865	90	Bh	=27	9·9
26	2867	50	Ma	34−1·5	10·2
27	2868	90	Bh	20−2, 27+3	9·6
27	2868	45	Br	=20	9·4
29	2870	50	Bn	18 (2) v (1) 27	9·7
29	2870	30	D	20−4, 27+1	9·8
July					
2	2873	50	Ma	=18, 20−1	9·4
2	2873	22	Ni	20 (4) v (2) 34	9·9
2	2873	90	Bh	20−1	9·5
4	2875	,,	,,	20+4	9·0
4	2875	30	D	20−2, 27+3	9·6
5	2876	32	Ca	16−3, =18	9·3
5	2876	50	Bn	13 (5) v (1) 18	9·1
7	2878	90	Bh	=7	8·1
7	2878	22	Ni	13 (2·5) v (2·5) 20	9·0
8	2879	30	D	9−3, 14+3	8·7
9	2880	50	Bn	7 (1) v (1) 13	8·4
9	2880	48	Wi	6−10, 20+10	8·5
10	2881	50	Ma	=7, 20+3	8·6
11	2882	90	Bh	6−1	7·6
11	2882	30	D	6 (5) v (1) 9, 9+2	8·2
12	2883	50	Bn	6 (1) v (2) 7	7·7
12	2883	22	Ni	=6	7·5
13	2884	30	D	6+2	7·3
18	2889	90	Bh	3−3, 6+9	6·7
20	2891	50	Ma	6+4·5	7·1

Dec. 21, Not held.
Mar. 9, About.
Mar. 24, Not seen.
April 4, Bn, t.

July 2, Ma, Red.
July 7, Bh, Orange.
July 10, Pale red.
July 20, Rich orange.

(7120) χ CYGNI—*continued.*

1921					
July					
21	2892	30	D	=3	6·4*b*
21	2892	50	Ma	6+5	7·0
24	2895	B	D	g−4, 2+1	6·0
25	2896	48	Wi	2+2	5·9
25	2896	F	Bn	1 (3) v (1) g	5·4
25	2896	B	D	g−2, 2+2	5·8
26	2897	,,	,,	g−3, 2+2	5·9
26	2897	45	Bh	2+5, 3+8	5·6
27	2898	B	Ni	g+2·5	5·3
28	2899	,,	D	=g	5·6*b*
29	2900	45	Bh	2+5, 3+10	5·5
30	2901	B	Ni	g+3	5·3
30	2901	,,	Co	1−5, g+2	5·5
30	2901	,,	D	1−4, g+1	5·5
31	2902	,,	Br	=g	5·6
31	2902	F	Wi	1−4, g+1	5·5
Aug					
1	2903	B	Co	1−3·5, g+4	5·3
1	2903	,,	D	1−4, g+2	5·4
3	2905	,,	,,	1−3, g+2	5·4
3	2905	,,	Co	1−3	5·4
4	2906	32	Ca	1−2	5·3
4	2906	B	Ni	g+3	5·3
6	2908	NE	Wi	1−2, g+3	5·3
6	2908	B	D	1−0·5, g+4	5·1*b*
6	2908	45	Bh	1−5, =g	5·6
6	2908	B	Ma	=1	5·1
7	2909	,,	,,	1−1	5·2
8	2910	,,	Bn	1 (5) v (2) g	5·4
8	2910	,,	D	1−2, g+3	5·3*b*
8	2910	NE	Wi	1−3, g+2	5·4
8	2910	B	Co	1−1	5·2
9	2911	,,	,,	1−2	5·3
9	2911	F	Bo	1+1	5·0
9	2911	B	Ma	1+2	4·9
9	2911	,,	D	1−0·5, g+4	5·1*b*
11	2913	,,	,,	=1	5·1
11	2913	,,	Ma	1−2	5·3
11	2913	,,	Co	1−1	5·2
13	2915	,,	Ni	1 (5) v (1) D	5·4
13	2915	,,	Ma	=1	5·1
14	2916	45	Bh	1−5, =g, 3+10	5·5
14	2916	B	Co	1−0·5	5·1
15	2917	,,	,,	R−4, 1−1	5·2
15	2917	94	Ni	1 (7) v (1·5) D	5·4
18	2920	B	Co	R−3, 1−0·5	5·1
18	2920	94	Ni	1 (6) v (1·5) D	5·4
18	2920	B	Ma	1+1·5	4·9
18	2920	,,	D	1−2, g+4	5·2*b*
19	2921	,,	,,	1−2, g+3	5·3*b*
19	2921	,,	Br	=1	5·1
19	2921	F	Bh	=g	5·6
21	2923	B	Co	R−4, 1−1, g+4	5·2
21	2923	94	Ni	1 (6) v (1·5) D	5·4
21	2923	B	D	1−3, g+2	5·4*b*
22	2924	,,	Ma	1−1	5·2
23	2925	F	Bo	1 (1) v (3) g	5·2
23	2925	B	D	1−3, g+2	5·4
24	2926	,,	,,	1−3, g+3	5·3
24	2926	94	Ni	D−1	5·5
25	2927	B	Bn	1 (3) v (1) g	5·4*b*
1921					
Aug					
25	2927	F	Bh	1−4, g+2	5·4
25	2927	B	Co	1−1, g+4	5·2
25	2927	,,	Ma	1−1	5·2
26	2928	,,	D	1−3, g+2·5	5·3
26	2928	94	Ni	D−1·5	5·6
26	2928	B	Br	1−1	5·2
27	2929	,,	Co	1−1·5, g+2	5·3
28	2930	,,	D	1−3, g+2	5·4
28	2930	94	Ni	D−2	5·6
29	2931	B	Ma	1+0·5	5·0
29	2931	,,	Co	R−5, 1−1, g+3·5	5·2
29	2931	F	Bh	g−1	5·7
30	2932	45	,,	1−4, g+2	5·1
30	2932	F	Bo	1 (2) v (3) g	5·3
30	2932	B	Br	=1	5·1
30	2932	,,	Ma	=1	5·1
30	2932	94	Ni	D−4	5·8*b*
30	2932	B	D	1−4, g+1	5·5
Sept					
1	2934	,,	,,	1−4, g+0·5	5·5
1	2934	,,	Ma	1+1	5·0
2	2935	,,	,,	1−2	5·3
3	2936	,,	Co	1−3, g+2	5·4
3	2936	,,	Bn	1 (2) v (1) g	5·4
3	2936	,,	D	1−4·5, g+1	5·5
4	2937	F	Bo	1 (1) v (3) g	5·2
5	2938	B	Co	1−2, g+3	5·3
5	2938	94	Ni	g+1	5·5
5	2938	F	Wi	1−2, g+2	5·3
5	2938	B	Br	1−1, g+4	5·2
5	2938	,,	Ma	1−2·5, =g	5·4
5	2938	45	Bh	1−4, g+2	5·4
6	2939	B	D	1−5, g+1	5·5
6	2939	,,	Co	1−4, g+1	5·5
7	2940	,,	Br	1−2, g+3	5·3
7	2940	,,	Bn	g+1	5·5
7	2940	,,	D	−g	5·6
7	2940	F	Wi	1−8, 3+5	5·9
7	2940	B	Ma	g+2	5·4
8	2941	,,	,,	g 0·5	5·6
8	2941	F	Wi	1 7, 2 +3	5·8
8	2941	94	Ni	g (1) v (3) 3	5·8
8	2941	B	D	g+0·5	5·5
8	2941	,,	Co	1 4, =g	5·5
8	2941	F	Bh	-g	5·6
9	2942	B	Bn	-g	5·6
10	2943	,,	Ma	g+1	5·5
10	2943	,,	Co	1−4, g+0·5	5·5
10	2943	45	Bh	2+3, 3+6	5·8
10	2943	B	Br	=g	5·6
10	2943	F	Wi	1 3, 3+10	5·4
12	2945	,,	,,	1 6, 2+4	5·7
12	2945	B	D	g 3, 2+2	5·9*b*
12	2945	F	Bo	1 (3) v (1) g	5·4
12	2945	B	Co	1 5, =g	5·6
14	2947	,,	,,	g 2, 2+2·5	5·8
14	2947	,,	Br	g 2, 2+3	5·8
14	2947	94	Ni	g (2·5) v (2·5) 3	6·0
14	2947	B	D	g−4, 2+2	5·9*b*
15	2948	,,	,,	g−4, 2+0·5	6·0*b*
15	2948	,,	Ma	2−1	6·2*b*
15	2948	,,	Bn	g (1) v (1) 2	5·8

July 21, D, With B, 6·6*b*. Ma, Fine orange.
Aug. 6, Ma, Orange.
Aug. 7, Pale orange.
Aug. 19, Br, About.
Aug. 25, Co, yellow with 80.
Sept. 3, Co, Yellow in t.
Sept. 6, Co, Rich yellow in t.
Sept. 8, Co, Deep yellow in t.

(7120) χ CYGNI—*continued.*

1921					
Sept					
16	2949	B	Co	g−3, 2+1	5·9
16	2949	,,	Br	2+1	6·0*b*
16	2949	45	Bh	=2	6·1
16	2949	94	Ni	g (3) v (3) 3	6·0
18	2951	30	Tn	=3	6·4
20	2953	,,	,,	2 (5) v (5) 3	6·2
21	2954	B	Bn	2 (1) v (2) 3	6·2
21	2954	45	Bh	2−1, 3+1	6·2
21	2954	B	Co	2−3	6·4
21	2954	,,	Ma	2−2	6·3*b*
21	2954	,,	D	2−2, 3+1	6·3
22	2955	94	Ni	g (5) v (1) 3	6·3
23	2956	55	Bo	g (3) v (1) 2	6·0
23	2956	B	Co	2−2	6·3
24	2957	F	Wi	=3	6·4*b*
24	2957	45	Bh	2−1	6·2
24	2957	B	Br	2−2	6·3
25	2958	55	Bo	g (3) v (1) 2	6·0
25	2958	B	Bn	2 (3) v (1) 3	6·3
25	2958	,,	D	2−3, 3+0·5	6·4
25	2958	,,	Ma	3+1	6·3
25	2958	,,	Co	2−3, =3	6·4
27	2960	,,	Ma	2 (2) v (1) 3, 3+2	6·3
27	2960	32	Ca	3−6, 0+3	7·0
27	2960	30	D	=3	6·4
27	2960	94	Ni	3−1	6·5
27	2960	F	Wi	=2	6·1
27	2960	B	Co	2−4, =3	6·4
28	2961	,,	,,	2−5, 3−1	6·5*b*
28	2961	45	Bh	2−2, 3+1	6·3
29	2962	B	Ma	3+1·5	6·3
29	2962	94	Ni	3+0·5	6·4
29	2962	B	Bn	3 (1) v (4) n	6·5
30	2963	55	Bo	g (1) v (1) 3	6·0
30	2963	30	D	3 (1) v (2) 6, 3−4	6·8
Oct					
1	2964	B	Br	3−1	6·5
1	2964	45	Bh	=3	6·4
1	2964	B	Co	3−2	6·6*c*
1	2964	30	Tn	3 (2) v (8) 6	6·6
1	2964	F	Wi	3−5	6·9
2	2965	,,	,,	3+1	6·3
2	2965	94	Ni	3−2	6·6
2	2965	B	Ma	3+0·5	6·4
4	2967	,,	,,	3−1·5	6·6
4	2967	P	Co	3−3	6·7*b*
4	2967	B	Bn	3 (2) v (1) n	6·8
4	2967	F	Wi	3−2	6·6
5	2968	,,	,,	3−4	6·8
5	2968	45	Bh	=3	6·4
6	2969	B	Ma	3−1·5	6·6
6	2969	F	Wi	=3	6·4
6	2969	22	Ni	3−3	6·7*b*
6	2969	55	Bo	3 (1) v (2) 4	6·5
7	2970	32	Ca	3−8, 0+1	7·2
8	2971	F	Bn	3 (2) v (1) n	6·8
8	2971	,,	Wi	3−6	7·0
8	2971	80	Co	=4	6·8

1921					
Oct					
9	2972	45	Bh	3−3	6·7
9	2972	F	Wi	3−7	7·1
11	2974	80	Co	4−1	6·9
13	2976	,,	,,	4−1·5	6·9
14	2977	45	Br	3−6, 6+6	7·0
15	2978	80	Co	4−1	6·9
16	2979	55	Bo	4 (1) v (1) 5	7·1*b*
16	2979	50	Bn	6+2	7·3
17	2980	45	Bh	2−10, 3−6, 7+10	7·1*b*
17	2980	80	Co	4−3·5	7·1
18	2981	,,	,,	4−4, 6+3	7·2
19	2982	30	Tn	6−1	7·6
21	2984	B	Ma	0−1	7·4
22	2985	80	Co	=6, 7+3	7·7
23	2986	,,	,,	=6	7·5
23	2986	B	Ma	6+1, 7+4	7·6
23	2986	45	Bh	3−10, 7+6	7·5
23	2986	50	Bn	6 (1) v (2) 7	7·7
23	2986	45	Br	=6	7·5
23	2986	30	Tn	6+2	7·3
25	2988	80	Co	6−1	7·6
28	2991	50	Ma	6+1	7·4
29	2992	80	Co	7+1	8·0
29	2992	32	Ca	6−4	7·9
30	2993	55	Bo	6 (1) v (2) 7	7·7
31	2994	90	Bh	6−2, 7+4	7·7
Nov					
1	2995	80	Co	=7	8·1
2	2996	22	Ni	6 (4) v (2) 13, 7 (4) v (2) 13	8·4
6	3000	55	Bo	6 (2) v (1) 7	7·9
6	3000	45	Br	6−2, 7+4	7·7
6	3000	50	Bn	6 (2) v (1) 7	7·9
6	3000	90	Bh	7+2	7·9
7	3001	30	Tn	=7	8·1
7	3001	50	Ma	7+1	8·0
8	3002	80	Co	7−2·5, =8	8·4
10	3004	,,	,,	7−3·5, 8−1	8·5
10	3004	50	Bn	7+1	8·0
10	3004	22	Ni	7 (4) v (1·5) 13	8·5
11	3005	55	Bo	7 (1) v (2) 9	8·2
12	3006	90	Bh	=7	8·1
15	3009	50	Ma	=7	8·1
17	3011	55	Bo	7 (2) v (5) 9	8·2
20	3014	32	Ca	16−1, 18+2	9·1
22	3016	22	Ni	=20	9·4
22	3016	90	Bh	7−6, 20+7	8·7
22	3016	55	Bo	9 (1) v (2) 11	8·5
23	3017	50	Bn	13 (4) v (1) 18	9·2
23	3017	,,	Ma	7−4, 20+2	8·9*b*
24	3018	48	Wi	18−1, =20	9·4
24	3018	90	Bh	20+3	9·1
25	3019	55	Bo	13 (2) v (1) 16	8·9
25	3019	80	Co	=20	9·4
26	3020	,,	,,	20−1, =23	9·5
27	3021	,,	,,	20−1, 23+2	9·4
27	3021	45	Br	16−2, 20+2	9·2

Sept. 16, Co, Dull yellow. Br, About.
Sept. 25, Co, Very rich yellow in 10-in. mirror ×80.
Sept. 27, D, With B, 6·6.
Sept. 28, Co, Difficult.
Oct. 1, Co, Dull orange red with 80.
Oct. 4, Co. P=1¾-in. OG.
Oct. 8, Co, Yellowish orange.
Oct. 11, 17, Co, Rich orange.
Oct. 13, 18, Orange red.
Oct. 15, Nov. 1, Orange.
Oct. 23, Ma, Pinkish.
Oct. 25, Ruddy.
Oct. 28, Orange with touch of red.
Nov. 7, Ma, Orange red.
Nov. 15, ±. Dull red.

(7120) χ CYGNI—*continued.*

1921 Dec					
3	3027	90	Bh	20−2, 27+3	9·6
3	3027	30	Tn	20 (5) v (5) 27	9·6
4	3028	80	Co	24−1, 29+1	9·6*b*
12	3036	79	Ma	20 (4) v (1) 27, 27+1	9·8
13	3037	45	Br	20−1	9·5
13	3037	90	Bh	20−5, =27, 34+3	9·9
17	3041	48	Wi	20−2, 27+3	9·6
17	3041	79	Ma	27−1	10·0
17	3041	80	Co	27−1, =34	10·0*c*
19	3043	90	Bh	34+1	10·0
20	3044	50	Bn	27 (2) v (1) 34	10·0*b*
23	3047	90	Bh	27−1, 34+1	10·0
24	3048	55	Bo	27 (1) v (2) 36	10·0
24	3048	94	Ni	=34	10·1
25	3049	45	Br	=27	9·9
26	3050	55	Bo	36 (1) v (2) 51	10·3
28	3052	75	Bn	34 (2) v (1) 51	10·4
29	3053	90	Bh	=34	10·1
29	3053	79	Ma	18−6, 56+2	10·3
1922 Jan					
1	3056	90	Bh	51−1	10·6
3	3058	120	Br	51−3, 67+6	10·8
4	3059	79	Ma	51+2, 56+1	10·6*b*
8	3063	90	Bh	56−1, 59−1	10·9
10	3065	22	Ni	62 (2) v (3) 67	11·1
10	3065	79	Ma	56−2, =62	11·1
16	3071	,,	,,	56 (2) v (1) 91	11·8
16	3071	85	Bn	67 (1) v (3) 74	11·4
18	3073	22	Ni	=67	11·3
18	3073	90	Bh	56−3, 74+4	11·2
20	3075	,,	,,	=67	11·3
23	3078	22	Ni	62 (5) v (1) 67	11·3
28	3083	90	Bh	56−5, 74+1	11·5
Feb					
17	3103	,,	,,	=92	12·2*b*
25	3111	22	Ni	92 (3) v (2) 107	12·6*b*
Mar					
19	3133	90	Bh	<104	<12·7
20	3134	94	Ni	107 (1) v (1) μ	13·1
28	3142	90	Bh	<104	<12·7
31	3145	94	Ni	107 (4) v (2) μ	13·2
Apr					
14	3159	90	Bh	<104	<12·7
19	3164	94	Ni	107 (4) v (1·5) μ	13·2
23	3168	90	Bh	<92	<12·2
29	3174	,,	,,	87−4, 92−2	12·4
29	3174	240	Br	κ−1	13·3
May					
2	3177	90	Bh	87−3, =92	12·2*b*
6	3181	120	Wi	97−6	12·8
8	3183	90	Bh	87−3, 92−1	12·3
13	3188	120	Br	104+1	12·6
15	3190	150	Bn	92 (1) v (1) 94	12·2
21	3196	94	Ni	92 (1·5) v (3) 107	12·4
21	3196	120	Bn	87 (1) v (1) 94	12·1
25	3200	,,	Br	87−2, 97+2	12·1
27	3202	94	Ni	67 (4) v (2) 87	11·7
June					
1	3207	,,	,,	62 (5) v (2) 67	11·2
1	3207	120	Bn	63 (3) v (1) 76	11·4

Dec. 24, Ni, With 22, 10·4.
Feb. 25, Approximately.
Mar. 19, 28; April 14, 23, Not seen.

1922 June					
25	3231	80	Co	=47, 50+2	10·
25	3231	T	Sa	7−10, 13−6, 18−3, 27+2	9·
26	3232	90	Bh	52+4, 58+6	10·
28	3234	79	Ma	27+1	9·
29	3235	160	Br	20−3	9·
30	3236	80	Ca	=36	10·
July					
2	3238	90	Bh	21−1	9·
10	3246	,,	,,	21+1, 34+5	9·
11	3247	80	Co	26−1·5, 27+0·5	9·
12	3248	22	Ni	20 (3) v (2) 34	9·
17	3253	32	Ca	18−1, 21+2	9·
18	3254	79	Ma	19+2	9·
18	3254	30	Bn	7 (3) v (2) 13	8·
18	3254	80	Co	=20	9·
20	3256	,,	,,	18+2, 20+2	9·
20	3256	45	Bh	7−8, 14+2, 21+6	8·
21	3257	T	Sa	6−5, 7−1, =9, 13+4	8·
21	3257	45	Br	=7	8·
23	3259	,,	Bh	=7	8·
24	3260	79	Ma	7+0·5	8·
27	3263	45	Bh	=6, 7+4	7·
30	3266	,,	Br	=6	7·
30	3266	80	Co	6−3, 7+1	7·
31	3267	50	Ma	6 (2) v (1) 7, 7+2	7·
Aug					
5	3272	90	Bh	6+3, 7+6	7·
7	3274	22	Ni	=0	7·
8	3275	80	Co	6+1	7·
11	3278	45	Bh	6+5, 7+10	7·
15	3282	22	Ni	3 (4) v (3) 0	6·
15	3282	30	Bn	6+1	7·
15	3282	,,	D	3 (4) v (1) 6, 6+2	7·
16	3283	B	Co	3−3	6·
17	3284	22	Ni	3 (4) v (4) 0	6·
17	3284	B	D	3−2	6·
17	3284	90	Bh	2−2, 3+1	6·
18	3285	45	,,	=2	6·
18	3285	B	Br	3−1	6·
19	3286	,,	Co	3−1	6·
19	3286	,,	Ma	2 (1) v (1) 3	6·
20	3287	45	Bh	=2	6·
20	3287	B	Wi	2−3, 3+3	6·
20	3287	22	Ni	3 (4) v (3) 0	6·
21	3288	,,	,,	=3	6·
23	3290	B	Co	2+0·5, 3+3	6·
23	3290	30	Bn	2 (3) v (1) 3	6·
23	3290	B	Br	=2	6·
23	3290	50	Ma	6+9	6·
25	3292	B	,,	1 (5) v (1) 2, 2+2	5·
25	3292	45	Bh	9−2, 2+2	5·
25	3292	T	Sa	3+4, 6+15	6·
25	3292	94	Ni	9 (3) v (2) 3	6·
26	3293	,,	,,	9 (2·5) v (2·5) 3	6·

June 25, Co, Difficult.
June 28, Red.
July 18, Ma, Very red. Co, Difficult.
July 24, Reddish.
July 27, Aug. 8, Orange.
July 31, Pale garnet.
Aug. 7, Approximately.
Aug. 15, D, 3-in.
Aug. 17, D, Difficult.
Aug. 23, Bn, With B, 6·0.
Aug. 23, Ma, Very pale orange, With B, 6·0

(7120) χ CYGNI—*continued.*

1922					
Aug					
26	3293	B	Co	g−1, 2+3	5·7
26	3293	,,	Wi	2−2, 3+4	6·1
27	3294	94	Ni	g (2) v (4) 3	5·8
28	3295	B	D	g−3, 2+2	5·9
29	3296	94	Ni	g+1	5·5
29	3296	B	Sa	1−5, g−3, h+1, 3+8	5·7
30	3297	,,	Ma	1 (2) v (1) 2	5·7
31	3298	,,	Sa	g−1, h+2, 2+4, 3+10	5·6
31	3298	,,	Ma	1−1	5·2
31	3298	45	Bh	1−5, =g, 2+5	5·6
31	3298	B	Co	1−3·5, g+3	5·3
Sept					
2	3300	,,	,,	1−3	5·4
3	3301	,,	Ma	1−1	5·2*b*
4	3302	45	Bh	1−2, g+2	5·3
5	3303	B	Ma	1−1·5	5·2*b*
6	3304	,,	Co	=1	5·1
7	3305	F	Bh	1−3, g+2	5·4
9	3307	B	Bn	1 (1) v (4) g	5·2
9	3307	,,	Ma	c (4) v (1) 1, 1+2	4·9
9	3307	,,	Sa	c−8, d−4, g+4, h+12, 2+15	4·8
10	3308	B	Co	R−1·5, 1+3	4·8
10	3308	94	Ni	1 (1) v (4) D	5·1
10	3308	B	D	R−3, 1+2	5·0*b*
10	3308	F	Bh	1+2	4·9
10	3308	B	Br	1+1	5·0
11	3309	,,	Ma	c (3) v (1) 1	4·8
11	3309	,,	Sa	c−10, d−7, e−5, g+8, h+12	4·9
11	3309	,,	Wi	1+1	5·0
12	3310	,,	D	R−2, 1+1	5·0
12	3310	94	Ni	1−1·5	5·1
13	3311	,,	,,	1+1·5	4·9
13	3311	B	Wi	1+1	5·0
13	3311	,,	Ma	c (3) v (2) 1	4·7
13	3311	,,	Co	=R, 1+4	4·7
13	3311	,,	Bn	R (2) v (3) 1	4·9
15	3313	,,	,,	c (4) v (1) R	4·6
15	3313	,,	Br	=R	4·7
15	3313	F	Bh	1+3	4·8
15	3313	B	Ma	c (3) v (2) 1	4·7
15	3313	,,	Sa	c−7, d−4, e−2, 1+7, g+8, h+10, 2+15	4·7
15	3313	,,	Co	=R, 1+4	4·7
17	3315	NE	,,	=R	4·7
17	3315	B	Bn	c (4) v (1) R	4·6
17	3315	,,	Ma	c (4) v (1) 1, 1+7	4·7
17	3315	94	Ni	=1	5·1
18	3316	,,	,,	1+1	5·0
18	3316	F	Bh	1+3	4·8
18	3316	B	Sa	c−7, e−3, g+7, 1+2	4·9
19	3317	,,	,,	c−8, d−6, =e, g+7, h+10	4·8
20	3318	,,	Bn	R+2	4·5
20	3318	,,	Co	=e, R+1	4·7
20	3318	,,	Ma	c (3) v (2) 1	4·7
20	3318	,,	Wi	1+1	5·0
21	3319	F	Bh	1+2	4·9
21	3319	B	Br	R+1	4·6*b*
22	3320	,,	Sa	c−7, d−3, e−1, g+8, h+10, 2+14	4·7

Aug. 31, Co, With 30, Yellow.
Sept. 20, Ma, With 50, Very pale red.

1922					
Sept					
24	3322	B	Sa	c−8, e−2, g+7	4·9
24	3322	,,	Co	e−1·5, =R	4·8
24	3322	,,	Bn	R+2	4·5
24	3322	NE	Ma	c (1) v (1) 1, 1+2·5	4·6
26	3324	,,	,,	c (4) v (1) 1, 1+2·5	4·8
26	3324	B	Br	=R	4·7*b*
26	3324	45	Bh	1+2, g+6	4·9
26	3324	B	D	=R, 1+3	4·8*b*
28	3326	,,	,,	c−6, R+2, 1+5	4·6
29	3327	,,	Co	R−1, 1+3	4·8
29	3327	,,	Bn	R+2	4·5
29	3327	,,	Br	=R	4·7
Oct					
1	3329	,,	Sa	c−5, e−2, g+8, 1+3	4·7
1	3329	,,	Ma	c (3) v (2) 1	4·7
1	3329	,,	Br	=R	4·7
2	3330	45	Bh	=1, g+5	5·1
3	3331	B	Br	R−1, 1+3	4·8
4	3332	,,	Sa	c−8, e−2, 1+2	4·9
6	3334	,,	Ma	c (2) v (1) 1	4·7
6	3334	,,	Co	=e, R+0·5, 1+4	4·7
6	3334	,,	Bn	R (1) v (2) 1	4·8
6	3334	94	Ni	1+1	5·0
7	3335	,,	,,	=1	5·1
7	3335	45	Bh	=1	5·1
7	3335	B	Ma	c (4) v (1) 1, 1+3·5	4·8
8	3336	,,	Co	=R, 1+4	4·7
10	3338	,,	Sa	c−8, d−6, 1−2, g+4, 2+15	5·0
11	3339	,,	,,	c−7, d−7, g+5, h+10, 2+12	4·9
11	3339	,,	Ma	c (2) v (1) 1	4·7
11	3339	,,	Co	R−1, 1+2·5	4·8
11	3339	,,	Br	1+2	4·9
12	3340	F	Bn	1+1	5·0
12	3340	45	Bh	=1	5·1
12	3340	B	Wi	1−1	5·2
13	3341	94	Ni	1 (3) v (2) D	5·3
13	3341	B	D	R−1, 1+2	4·9
13	3341	,,	Co	R−2, 1+2	4·9
13	3341	,,	Ma	1+1·5	4·9
14	3342	,,	Br	=1	5·1
14	3342	,,	Bn	1+1	5·0
14	3342	,,	Sa	1−3, g+4, h+7, 2+12	5·1
14	3342	,,	Wi	1−1	5·2
15	3343	,,	D	R−3, 1+1	5·0
15	3343	94	Ni	1 (1) v (4) D	5·1
15	3343	B	Co	=1	5·1
16	3344	,,	Ma	c (6) v (1) 1, 1+2	4·9
18	3346	45	Bh	1−2, g+3	5·3
18	3346	B	Co	=1, g+3·5	5·1
18	3346	94	Ni	=D	5·4
21	3349	,,	,,	D (3) v (5) g	5·5
21	3349	B	Sa	1−6, g+1, h+3	5·3
21	3349	F	Bh	1−2, g+2	5·3
21	3349	B	Br	=1	5·1
22	3350	,,	Bn	1 (1) v (3) g	5·2
22	3350	,,	Ma	c (7) v (1) 1	4·9
22	3350	,,	D	=1	5·1

Sept. 29, Co, With 30, Clear yellow.
Oct. 7, Ma, Red.
Oct. 12, Bn, With B, 50.
Oct. 13, 15, Co, With 30, Dull orange.
Oct. 22, Ma. Reddish.

(7120) χ CYGNI—*continued.*

1922 Oct					
25	3353	B	Ma	1−2	5·3
25	3353	94	Ni	D (3) v (5) g	5·5
25	3353	B	Wi	1−2	5·3
25	3353	45	Bh	1−2	5·3
26	3354	B	Sa	1−4, =g, h+4, 2+7	5·4
27	3355	,,	,,	1−6, =g, h+6, 2+8	5·4
27	3355	,,	Co	1−3, g+3	5·3
27	3355	,,	Bn	1 (1) v (2) g	5·2
27	3355	,,	Br	1−2, g+2	5·3
28	3356	,,	Ma	1 (1) v (2) h, 1 (2) v (1) 2	5·5*b*
28	3356	94	Ni	D (4) v (3) g	5·5
30	3358	B	Co	1−4, g+2	5·4
Nov					
1	3360	,,	Br	=g	5·6
1	3360	,,	Bn	1 (3) v (1) g	5·4
1	3360	45	Bh	1−5, =g	5·6
1	3360	B	Co	g+2	5·4
1	3360	,,	Sa	g−3, h+3, 2+5	5·6
1	3360	,,	Ma	g (1) v (2) 2	5·7
2	3361	,,	Bg	g−3, 2+2	5·9
4	3363	,,	Ma	g (1) v (4) 2	5·7
4	3363	,,	Co	g−1	5·7
6	3365	33	Wi	1−9, 3+4	6·0
6	3365	B	Ma	2+1·5	5·9*b*
8	3367	25	Gr	=2	6·1
9	3368	B	Ma	2−1	6·2
9	3368	94	Ni	g (1·5) v (3) 3	5·8
9	3368	B	Co	g+1	5·5
9	3368	45	Bh	g−2, 2+3	5·8
11	3370	B	Br	2−1	6·2
11	3370	37	Lp	1 (2) v (2) 3	5·7*b*
12	3371	94	Ni	g (4) v (1) 3	6·2
13	3372	B	Ma	2−1·5	6·2
13	3372	,,	Sa	f−10, g−5, h−3, 2+2, 3+6	6·0
13	3372	,,	Bn	g (3) v (1) 2	6·0
14	3373	,,	Co	2−1, 3+3	6·1
15	3374	94	Ni	g (4) v (1) 3	6·2
16	3375	B	Br	2−2, 3+1	6·3
16	3375	25	Gr	2+3	5·8
17	3376	45	Bh	g−4, 2+2	5·9
18	3377	B	Bn	2 (2) v (1) 3	6·3
18	3377	,,	Co	2−3, 3+1	6·3
18	3377	94	Ni	=3	6·4
19	3378	45	Bh	=2	6·1
23	3382	50	Ma	6+5, 7+8	7·2
23	3382	30	Co	=3	6·4
24	3383	94	Ni	3 (2) v (4) 0	6·7
24	3383	45	Bh	2−1, 3+2	6·2
24	3383	F	Bn	2 (4) v (1) 3	6·3
24	3383	B	Br	3−2	6·6
24	3383	100	Lp	3−1	6·5
29	3388	50	Ma	6+4, 7+7	7·3
Dec					
1	3390	45	Bh	=3	6·4
1	3390	30	Co	=3	6·4
2	3391	B	Sa	1−15, 2−5, 3−2, 6+10	6·6
6	3395	50	Ma	6+4, 7+7	7·3
6	3395	45	Bh	=3	6·4
6	3395	30	Bn	n (1) v (3) 6	7·1
8	3397	22	Ni	3 (4) v (3) 0	6·9
11	3400	45	Br	=3	6·4
11	3400	,,	Bh	3−3, 6+8	6·7
14	3403	22	Ni	0 (3) v (3) 6	7·4
17	3406	45	Bh	3−7, 6+4	7·1
17	3406	30	Co	3+1	6·3
18	3407	F	Bn	n (4) v (1) 6	7·4
20	3409	37	Lp	3 (4) v (1) 6	7·3
20	3409	33	Wi	7+1	8·0
22	3411	30	Co	6−2, 7+1	7·9
24	3413	,,	,,	7−2	8·1
24	3413	,,	Bn	6+1	7·4
25	3414	45	Bh	=6	7·5
26	3415	22	Ni	6 (4) v (1) 7	8·0
26	3415	48	Bg	6−1·5, 7+4·5	7·7
27	3416	B	Sa	3−15, =6, 7+6, 9+8, 18+15	7·7
28	3417	90	Bh	=6, 7+5	7·6
30	3419	22	Ni	7 (2) v (2) 13	8·2
1923 Jan					
3	3423	33	Wi	7−1	8·2
3	3423	51	Ma	6 (6) v (1) 7	8·0
4	3424	50	,,	6 (2) v (1) 7	7·9
4	3424	90	Bh	=7	8·1
4	3424	45	Br	6−2, 7+4	7·7
4	3424	30	Bn	7 (2) v (3) 13	8·3
8	3428	,,	,,	7 (2) v (1) 13	8·5
9	3429	90	Bh	6−10, 7−5	8·6
9	3429	50	Ma	7+1	8·0
9	3429	44	Wi	13−1, 16+2	8·8
10	3430	48	Bg	7−1, 11+4	8·2
12	3432	50	Ma	7+1·5	8·0
14	3434	90	Bh	7−7, 14+1, 20+7	8·8
14	3434	30	Bn	13 (1) v (3) 18	8·8
14	3434	37	Lp	13 (2) v (2) 16	8·8
15	3435	22	Ni	13 (2) v (1) 20	9·2
20	3440	90	Bh	7−7, 20+5	8·9
20	3440	37	Lp	=17	9·2
20	3440	75	Bn	13 (1) v (1) 18	9·0
23	3443	,,	,,	13 (2) v (1) 18	9·1
23	3443	22	Ni	=20	9·4
24	3444	...	Sa	6−8, 7−4, 9−3, 18+7, 27+12	8·6
27	3447	90	Bh	20+3	9·1
Feb					
3	3454	,,	,,	20+1	9·3
4	3455	...	Sa	18−4, 27+6	9·5
8	3459	90	Bh	=20	9·4
16	3467	,,	,,	20−5, =27	9·9
17	3468	22	Ni	=51	10·5
23	3474	90	Bh	20−8, 27−3, 34−1	10·2
25	3476	,,	,,	34−1	10·2
Mar					
5	3484	,,	,,	=51	10·5
13	3492	,,	,,	56−1, =59	10·9
16	3495	94	Ni	62 (4) v (1) 67	11·3
20	3499	,,	,,	=67	11·3

Nov. 4, Co, With 30, Rich orange.
Nov. 11, Lp, Very ruddy.
Nov. 23, Ma, Rich orange-red, With B, 6·6. Co, Orange.
Nov. 24, Lp, Very ruddy.
Nov. 29, Orange, with touch of red.

Dec. 11, Br, About, With B, 7·0.
Dec. 17, Co, Orange-red.
Dec. 20, Lp, Coppery colour.
Jan. 4, Ma, Reddish.
Jan. 9, Ma, Pale red.

(7120) χ CYGNI—*continued.*

1923					
Mar					
26	3505	90	Bh	67−3, =75, 87+4	11·6
Apr					
1	3511	,,	,,	=87	11·9
5	3515	94	Ni	67 (4) v (2) 87	11·7
8	3518	,,	,,	=92	12·2*b*
12	3522	90	Bh	87−2, 92+1	12·1
16	3526	,,	,,	=92, =97	12·2
22	3532	94	Ni	92 (4) v (1) 107	12·7
May					
3	3543	120	Br	<107	<12·8
3	3543	90	Bh	<97	<12·2
9	3549	,,	,,	101−3, =107	12·8
13	3553	94	Ni	=107	12·8
20	3560	157	Wf	104−5, λ+1	13·2
25	3565	94	Ni	107 (1) v (2) μ	13·0
30	3570	90	Bh	<97	<12·2
June					
2	3573	,,	,,	<87	<11·9
5	3576	150	Wf	107−3, =κ	13·1
6	3577	90	Bh	87−10, =107	12·9
11	3582	,,	,,	87−5	12·4
11	3582	150	Lp	<104	<12·7*b*
22	3593	,,	,,	=98	12·5*b*
23	3594	90	Bh	=87	11·9
July					
1	3602	,,	,,	56−3, 59−2	11·1
2	3603	150	Lp	75 (2) v (2) 87	11·7*b*
3	3604	,,	Wf	75−3, 87+1	11·8
4	3605	130	Ma	87+2, 92+4	11·8
5	3606	94	Ni	87+1	11·8
6	3607	150	Lp	=76	11·5
6	3607	96	Gr	87−1, 92+2	12·0*b*
8	3609	90	Bh	27−5, 34−1	10·2
10	3611	157	Wf	=67, 75+1	11·4
10	3611	94	Ni	62 (5) v (1) 67	11·3
12	3613	150	Lp	=63	11·0*b*
13	3614	60	D	=67	11·3*b*
13	3614	150	Wf	51−2, =59	10·8
13	3614	96	Gr	=58	10·9
14	3615	90	Bh	20−5, =27, 34+2	9·9*b*
16	3617	60	D	=58	10·9
18	3619	100	Lp	47 (2) v (2) 49	10·6*b*
19	3620	...	Sa	=27	9·9
20	3621	60	D	34−3, 51+2	10·4
20	3621	34	Li	26 (5) v (5) 27	9·8
20	3621	90	Bh	20−2	9·6
21	3622	22	Ni	=51	10·5
22	3623	62	Wf	27−1, =34	10·0
26	3627	...	Sa	=20	9·4
26	3627	100	Lp	27 (2) v (2) 29	9·8*b*
26	3627	45	Bh	20+1, 27+6	9·3
27	3628	60	D	20−4, 27+1	9·8
30	3631	96	Gr	=34	10·1
30	3631	90	Bh	20+2	9·2
Aug					
1	3633	,,	,,	7−9, 20+3	9·1
1	3633	22	Ni	20 (3) v (1) 34	9·9
1	3633	32	Ca	18 (1) v (2) 21	9·4
3	3635	45	Br	20+3	9·1
3	3635	90	Bh	7−5, 20+6	8·7
6	3638	51	Ma	20 (1) v (1) 27	9·6
6	3638	62	Wf	=13, 16+3	8·7
8	3640	50	Bn	7 (4) v (1) 13	8·6
8	3640	90	Bh	7−1	8·2
9	3641	...	Sa	9−3, =13, 18+3, 21+5	8·9
11	3643	30	D	9−4, 20+6	8·8
11	3643	37	Lp	13 (2) v (2) 16	8·8*b*
11	3643	30	Co	14+1, 15+2, 20+3	9·0*b*
11	3643	90	Bh	6−5, 7+1	8·0
11	3643	50	Bn	7 (2) v (1) 13	8·5
12	3644	62	Wf	7 (5) v (5) 13	8·4
13	3645	50	Bn	7 (1) v (2) 13	8·3
13	3645	30	Bg	13 (1) v (1) 14	8·9*b*
13	3645	37	Lp	=13	8·7
15	3647	,,	,,	9 (2) v (2) 13	8·5
15	3647	...	Sa	7−4, =13, 16+3	8·6
15	3647	90	Bh	6−3, 7+3	7·8
15	3647	30	Co	=8, 11+4	8·3
18	3650	37	Lp	7 (2) v (1) 9	8·3
18	3650	90	Bh	6−4, 7+2	7·9
21	3653	37	Lp	=7	8·1*b*
21	3653	30	Co	=7	8·1
22	3654	90	Bh	6−2, 7+4	7·7
26	3658	45	,,	=6	7·5
26	3658	30	Co	6−4, =7	8·0
28	3660	,,	,,	7−1, 8+3·5	8·1
28	3660	50	Bn	6 (2) v (1) 7	7·9
28	3660	...	Sa	6−4, 7+2	7·9*b*
30	3662	90	Bh	6−3, 7+3	7·8
30	3662	30	Co	=7	8·1
30	3662	96	Gr	=13	8·7
30	3662	37	Lp	6 (2) v (2) 7	7·8*b*
30	3662	62	Wf	6−2, 7+3	7·8
Sept					
1	3664	45	Br	6−2, 7+4	7·7
1	3664	30	D	6−4, 7+2	7·9
2	3665	22	Ni	7 (2·5) v (2·5) 13	8·4
2	3665	90	Bh	6−3, 7+3	7·8
3	3666	30	Co	=7	8·1
3	3666	37	Lp	6 (2) v (2) 7	7·8*b*
3	3666	32	Ca	7 (1) v (2) 9	8·2
4	3667	90	Bh	6−3, 7+3	7·8
5	3668	50	Bn	6 (3) v (2) 7	7·9
5	3668	30	Co	=7, 8+3	8·1
5	3668	37	Lp	6 (2) v (2) 7	7·8*b*
5	3668	50	Ma	6−2	7·7
6	3669	22	Ni	7 (3) v (2) 13	8·4
7	3670	62	Wf	=7	8·1
7	3670	37	Lp	=6	7·5
7	3670	30	Co	6−1, 7+2	7·8
7	3670	90	Bh	6−2, 7+4	7·7
7	3670	45	Br	=6	7·5
8	3671	32	Ca	6 (3) v (3) 7	7·8
8	3671	30	D	6−4, 7+3	7·9
9	3672	37	Lp	=6	7·5
10	3673	B	Br	6−1	7·6
10	3673	90	Bh	6−1	7·6
11	3674	37	Lp	=6	7·5
11	3674	30	Co	6−1, 7+2	7·8
11	3674	50	Bn	6 (1) v (1) 7	7·8
12	3675	96	Gr	6+4	7·1
12	3675	B	Ma	=6, 7+2	7·7*b*
12	3675	90	Bh	=6	7·5
13	3676	,,	,,	6−2, 7+4	7·7
13	3676	45	Br	6+1	7·4
13	3676	...	Sa	5−2, 6+1	7·5

May 3, Br, Glimpsed.
May 3, 30, June 2, Bh, Not seen.
June 11, Lp, Not seen.
July 13, D, About.

Sept. 12, Ma, Just glimpsed.

(7120) χ CYGNI—*continued.*

1923					
Sept					
13	3676	F	Wf	=6, 7+5	7·6
13	3676	32	Ca	=0	7·3
13	3676	22	Ni	0 (6) v (1) 6	7·5
13	3676	30	Co	=6, 7+4	7·6
15	3678	,,	,,	=5, 6+2·5	7·3*b*
15	3678	37	Lp	3 (9) v (1) 6	7·4
16	3679	32	Ca	3 (8) v (1) 0	7·2
16	3679	90	Bh	6−1, 7+5	7·6
17	3680	,,	,,	6+1	7·4
17	3680	F	Bg	6+4	7·1*b*
17	3680	30	Co	5+1	7·3
17	3680	37	Lp	3 (3) v (1) 6, =5	7·3*b*
18	3681	30	D	4−5, 6+5	7·1
19	3682	90	Bh	6+3	7·2
20	3683	32	Ca	3 (6) v (3) 0	7·0*b*
21	3684	45	Bh	6+5, 7+10	7·1
21	3684	30	Co	3 (2) v (2) 5	6·9
21	3684	37	Lp	3 (3) v (2) 6	7·1*b*
21	3684	30	D	4−3, 6+5	7·0
22	3685	B	Ma	3−5	6·9*b*
22	3685	32	Ca	3 (4) v (5) 0	6·8
23	3686	,,	,,	3 (2) v (7) 0	6·6
23	3686	F	Bn	3 (1) v (2) n	6·6
24	3687	32	Ca	3 (1) v (8) 0	6·5
25	3688	,,	,,	=3	6·4
25	3688	22	Ni	g (4) v (2) 3	6·1*b*
26	3689	45	Bh	2−3, =3, 6+10	6·4
27	3690	B	Ma	=3	6·4
28	3691	,,	Br	2−2, 3+2	6·2
28	3691	30	Co	3−1	6·5
28	3691	96	Gr	2−1	6·2
29	3692	32	Ca	2 (2) v (1) 3	6·3
29	3692	...	Sa	1−6, 2+2, 3+4	5·9
29	3692	25	Bn	2 (2) v (1) 3	6·3
30	3693	45	Br	2−2, 3+1	6·3
30	3693	,,	Bh	=2	6·1
30	3693	B	Co	2−1, 3+2	6·2
30	3693	37	Lp	=2	6·1*b*
30	3693	F	Wf	2−1, =3	6·3
30	3693	30	D	3+1	6·3
Oct					
2	3695	32	Ca	2 (2) v (2) 3	6·2
4	3697	B	Ma	=2	6·1
4	3697	37	Lp	1 (2) v (1) 2	5·7
4	3697	45	Bh	2+5	5·6
4	3697	50	Bn	2+1	6·0
7	3700	45	Bh	=g, 2+7	5·5
8	3701	B	Co	=2	6·1
8	3701	F	Wf	1−5, =g	5·6
9	3702	B	Ca	h (3) v (1) 2	6·0
9	3702	,,	Br	=2	6·1
9	3702	F	Bh	1−5, =g	5·6
10	3703	96	Gr	2+10	5·1*b*
11	3704	B	Sa	h−2, 2+1	6·0
11	3704	,,	Br	g−3, 2+2	5·9
11	3704	F	Bh	1−3, g+2	5·4
12	3705	,,	,,	=1	5·1
12	3705	B	Co	1−3·5, g+1	5·4

Sept. 13, Co, Orange.
Sept. 15, Co, Deep yellow.
Sept. 17, Lp, Very red.
Sept. 18, 6^c·5.
Sept. 27, About.
Sept. 28, Co, Clear yellow.
Sept. 30, D, 6^c, With B, 6·4.
Oct. 4, Ma, About, With 50, Pale orange. Lp, 7^c.

1923					
Oct					
12	3705	B	Ma	1 (1) v (1) h, 1−2	5
12	3705	,,	Ca	g (4) v (2) 2	5
12	3705	,,	Ni	D (3) v (4) g	5
13	3706	,,	D	1−3, g+2	5
13	3706	37	Lp	1 (1) v (2) 3	5
14	3707	B	Br	1−2, g+3	5
14	3707	,,	Co	1−1, g+3	5
14	3707	,,	Ma	1+2	4
14	3707	F	Bn	=1	5
15	3708	B	Ni	1 (4) v (2) D	5
15	3708	,,	D	1−3, g+2	5
15	3708	,,	Bg	1 (3) v (1) g	5
16	3709	,,	Ma	1−2	5
17	3710	,,	,,	1+1·5	4
17	3710	,,	Co	=1	5
17	3710	F	Bh	=1	5
19	3712	,,	,,	=1	5
19	3712	B	Ca	1 (2) v (3) g	5
20	3713	,,	,,	1 (1) v (4) g	5
20	3713	,,	Br	1+1	5
21	3714	,,	Co	1+2·5	4
21	3714	,,	Ma	1+2	4
22	3715	,,	,,	1+1	5
22	3715	,,	Sa	1−1, g+4	5
22	3715	37	Lp	1 (1) v (4) g, =1	5
22	3715	50	Bn	1+1	5
22	3715	B	Bg	1 (1) v (3) g	5
23	3716	F	Bh	=1	5
23	3716	B	Co	1+2	4
24	3717	,,	Sa	1+1	5
24	3717	,,	Ma	1+2	4
25	3718	,,	,,	1+2·5	4
25	3718	NE	Ca	e (3) v (1) 1	5
25	3718	B	Co	R−0·5, 1+2	4
25	3718	,,	Bn	c (6) v (1) R	4
26	3719	,,	Br	1+0·5	5
26	3719	,,	Ni	1+1	5
26	3719	F	Bh	=1	5
27	3720	,,	,,	1+2	4
27	3720	NE	Ca	e (2) v (2) 1	4
27	3720	B	Wi	1+1	5
27	3720	F	Wf	1+0·5, g+6	5
27	3720	B	Co	R−3, 1+2	5
28	3721	,,	Br	1−1	5
28	3721	,,	Bn	c−6·5, R+1	4
28	3721	F	Lp	=R	4
28	3721	B	Ma	1+2·5	4
29	3722	,,	Co	=1	5
30	3723	,,	Br	1−0·5	5
31	3724	,,	,,	1+0·5	5
31	3724	,,	Co	R−2, 1+2	4
31	3724	10	Wi	1+2	4
Nov					
1	3725	NE	Ca	e (2) v (2) 1	4
2	3726	,,	,,	d (4) v (2) 1	4
2	3726	B	D	R−1, 1+3	4
2	3726	F	Lp	=R	4
2	3726	B	Co	R−2, 1+3	4
2	3726	10	Wi	1+3	4
3	3727	,,	,,	1+2	4

Oct. 14, Bn, With B, 5·1.
Oct. 20, Br, About.
Oct. 21, Ma, With 79, Pale yellow.
Oct. 22, Ma, With 51, Yellow with dash of re
Bn, With B, 5·0.
Oct. 25, Ma, Orange.

(7120) χ CYGNI—*continued.*

1923 Nov					
3	3727	B	Sa	1+1	5·0
3	3727	F	Bh	1+1	5·0
3	3727	B	Bn	R+2	4·5
3	3727	,,	Ma	1−1	5·2
4	3728	,,	,,	1+1	5·0
4	3728	,,	Bg	e (2) v (1) 1	4·9
4	3728	,,	Br	1+0·5	5·0
4	3728	NE	Ca	d (3) v (2) 1	4·8
4	3728	B	D	R−4, 1+2	5·0
4	3728	,,	Ni	S (5) v (2) 1	5·0
6	3730	F	Bh	1+2	4·9
6	3730	B	Co	1+3	4·8
6	3730	,,	Ma	1−2	5·3*b*
6	3730	,,	Sa	c−6, 1+3	4·7
7	3731	,,	,,	1+1, g+4	5·1
7	3731	NE	Ca	d (3) v (2) 1	4·8
7	3731	B	Ma	1+1·5	4·9
7	3731	,,	Bn	R+2	4·5
7	3731	,,	Wi	1+1	5·0
8	3732	37	Lp	=R	4·7*b*
8	3732	B	Ni	S (5·5) v (1·5) 1	5·0
10	3734	,,	Br	=1	5·1
10	3734	,,	Bn	R+1	4·6
10	3734	F	Bh	1+2	4·9
10	3734	B	Ma	1−1	5·2
10	3734	,,	D	R−2, 1+3	4·9
10	3734	,,	Ni	=1	5·1
11	3735	,,	,,	S (6) v (1) 1	5·0
11	3735	NE	Ca	d (3) v (2) 1	4·8
11	3735	10	Wi	=1	5·1
11	3735	B	Ma	1+3	4·8
11	3735	,,	Co	1+0·5, g+4	5·1
13	3737	,,	D	1+3	4·8*b*
14	3738	,,	Ni	1+0·5	5·0
14	3738	10	Wi	1+1	5·0
14	3738	B	Sa	1+1	5·0
14	3738	,,	Ma	1+3	4·8
14	3738	37	Lp	=1	5·1
14	3738	B	Br	=1	5·1
14	3738	,,	Co	=1	5·1
16	3740	,,	,,	=1	5·1
16	3740	,,	Bg	=1	5·1
16	3740	,,	Br	=1	5·1
16	3740	F	Bh	1+2	4·9
16	3740	B	Sa	=1	5·1
16	3740	,,	Wi	1+0·5	5·0
17	3741	,,	Bn	R (1) v (2) 1	4·8
17	3741	,,	Ma	1+1	5·0*b*
18	3742	,,	,,	1+2	4·9
18	3742	10	Wi	1+1	5·0
18	3742	B	Co	=1	5·1
19	3743	,,	Br	=1	5·1
20	3744	F	Bh	1+2	4·9
22	3746	B	Ca	d (4) v (2) 1	4·8
22	3746	,,	Co	=1	5·1
23	3747	,,	Sa	1−4, g+2	5·4*b*
23	3747	F	Bh	1+2	4·9
23	3747	,,	Bn	1 (1) v (4) g	5·2
23	3747	B	Ma	1−1·5	5·2*b*
24	3748	,,	,,	1−2·5	5·3*b*
1923 Nov					
24	3748	B	Br	1−1	5·2
24	3748	,,	Co	=1	5·1
25	3749	,,	,,	1−1, g+4	5·2
25	3749	NE	Ca	e (3) v (1) 1	5·0
26	3750	B	Ma	1 (2) v (1) 2	5·7*b*
27	3751	NE	Ca	=1	5·1
30	3754	F	Wf	1−3, g+2	5·4
30	3754	B	Co	1−1	5·2
30	3754	F	Bh	1−2, g+3	5·3
30	3754	,,	Bn	1 (1) v (2) g	5·2
30	3754	B	Br	g+1	5·5
Dec 2	3756	,,	,,	=g	5·6
2	3756	F	Lp	1 (1) v (2) 2, 1 (2) v (2) g	5·4*b*
2	3756	10	Wi	1−3	5·4
3	3757	B	Sa	1−4, =g, 2+5	5·5
3	3757	,,	Ma	1 (5) v (1) 2	5·9*b*
4	3758	,,	,,	1 (3) v (1) 2	5·8
4	3758	,,	Wi	1−2, g+4	5·2
5	3759	,,	Ca	1 (3) v (2) g	5·4
6	3760	,,	Ma	1 (3) v (1) 2	5·8
6	3760	,,	Br	2+1	6·0
7	3761	,,	Ca	1 (4) v (1) g	5·5
8	3762	F	Bh	1−5, =g	5·6
9	3763	B	Ni	D (2) v (4) g	5·5
9	3763	,,	Ma	1 (5) v (1) 2, 2+2·5	5·9
9	3763	100	Lp	1 (2) v (1) g	5·4*b*
9	3763	B	Co	1−4, =g	5·5
9	3763	,,	Br	2−1	6·2
9	3763	,,	D	1−2, g+4	5·2
10	3764	,,	,,	1−3, g+3	5·3*b*
11	3765	,,	Ni	g+3	5·3
11	3765	F	Wf	1−4, g+1	5·5
12	3766	,,	Bh	1−3, g+2	5·4
13	3767	32	Ca	g (2) v (4) 2	5·7
13	3767	B	Sa	=h	5·7
15	3769	F	Bn	1 (4) v (1) g	5·5
15	3769	B	Ma	2+1	6·0
15	3769	F	Bh	=g	5·6
18	3772	,,	,,	2+5, 3+10	5·5
18	3772	B	Br	2−2, 3+2	6·2
19	3773	F	Bn	1 (3) v (1) g	5·4
19	3773	B	Sa	=2	6·1
19	3773	,,	Ma	2+1	6·0
20	3774	,,	,,	=2	6·1*b*
22	3776	F	Bh	1−5, 2+5	5·6
23	3777	B	Bg	2 (1) v (3) 3	6·2
23	3777	100	Lp	=g	5·6*b*
23	3777	F	Ma	2+2	5·9*b*
24	3778	B	Co	g+0·5	5·5*b*
24	3778	45	Bh	1−5, 3+10	5·5
28	3782	,,	,,	2+3, 3+10	5·6*b*
28	3782	B	Br	=3	6·4
28	3782	,,	Sa	2−2, =3	6·3
28	3782	,,	Ma	=2	6·1
30	3784	,,	,,	2−2, 3+1	6·3
30	3784	22	Ni	g (3) v (3) 3	6·0*b*
30	3784	B	D	2−1, 3+2	6·2
1924 Jan 1	3786	,,	Br	3−1	6·5

Nov. 3, Ma, Very difficult.
Nov. 6, Ma, With 50, Orange.
Nov. 10, Ma, With 50, Straw yellow. D, 8c, Very ruddy in reflector.
Nov. 14, Ma, Reddish orange.
Nov. 18, Ma, With 50, Pale orange.

Dec. 4, 15, Ma, With 50, Pale orange.
Dec. 23, Ma, With T, Rich orange with touch of red. With B, 6·3.
Dec. 30, Ma, With 79, Pale orange.

(7120) χ CYGNI—*continued.*

1924					
Jan					
3	3788	45	Bh	2+2, 3+8	5·7
3	3788	B	Sa	3−1	6·5
4	3789	,,	Br	3−1	6·5
4	3789	22	Ni	g (5) v (0·5) 3	6·3
5	3790	100	Lp	3 (2) v (2) 6	7·0*b*
6	3791	50	Bn	2 (2) v (1) 3	6·3
6	3791	45	Br	=3	6·4
6	3791	B	Ca	3 (1) v (1) m	6·5
6	3791	31	D	3 (1) v (4) 4	6·5
6	3791	22	Ni	3−1	6·5
6	3791	10	Wi	3−3	6·7
7	3792	45	Bh	=2	6·1
11	3796	,,	,,	=2	6·1
15	3800	22	Ni	3 (6) v (2) 0	7·1
16	3801	B	Sa	3−2, 6+5	6·8*b*
17	3802	62	Wf	2−5, 6+7·5	6·7
19	3804	22	Ni	=0	7·3
20	3805	50	Bn	6+2	7·3
20	3805	45	Bh	=2, =3	6·2*b*
23	3808	,,	,,	2 (1) v (1) 3	6·2
25	3810	22	Ni	0 (1) v (1) 6	7·4
25	3810	50	Ma	6+5	7·0
25	3810	,,	Bn	6+1	7·4
26	3811	45	Bh	=3	6·4
27	3812	100	Lp	6 (2) v (2) 7	7·8
27	3812	34	Sa	3−5, 5−1, 6+2, 7+7	7·3
27	3812	45	Br	=6	7·5
31	3816	,,	Bh	3−4, 6+6	6·9
Feb					
1	3817	22	Ni	6 (3) v (1) 7	8·0
1	3817	50	Bn	6 (1) v (3) 7	7·7
2	3818	32	Ca	6 (1) v (1) q	7·6
4	3820	50	Bn	6 (2) v (1) 7	7·9
8	3824	62	Wf	6 (1) v (2) 7	7·7
11	3827	45	Bh	3 (2) v (1) 6	7·2
12	3828	32	Ca	7 (2) v (1) 9	8·3
14	3830	50	Bn	6 (4) v (1) 7	8·0
14	3830	45	Bh	6+2, 7+6	7·4
15	3831	32	Ca	9 (2) v (1) 13	8·6
17	3833	22	Ni	7 (3) v (1) 13	8·5
22	3838	45	Bh	=7	8·1
26	3842	90	,,	7 (1) v (1) 20	8·8
28	3844	22	Ni	13 (3) v (1) 20	9·2
Mar					
1	3846	90	Bh	7 (3) v (1) 20	9·1
1	3846	32	Ca	13 (2) v (1) 16	8·9
3	3848	90	Bh	7−10, 20+2, 27+6	9·2
4	3849	50	Bn	13 (5) v (2) 18	9·1
4	3849	30	D	20−1, 27+4	9·5
6	3851	22	Ni	13 (4) v (1) 20	9·2
6	3851	32	Ca	18 (1) v (2) 21	9·4
8	3853	50	Bn	=18	9·3
10	3855	64	Sa	20−2, 27+2	9·6
10	3855	90	Bh	=27	9·9
12	3857	22	Ni	20 (2) v (2) 34	9·7
13	3858	50	Bn	18 (5) v (2) 27	9·7
13	3858	32	Ca	18 (2) v (4) 27	9·5
14	3859	90	Bh	34−1	10·2
22	3867	,,	,,	=34	10·1
27	3872	,,	,,	=34	10·1
29	3874	,,	,,	34−1	10·2
29	3874	22	Ni	34 (2) v (3) 51	10·3

Jan. 6, Br, Orange. D, With B, 6·6.
Mar. 10, Bh, Orange.

1924					
Apr					
1	3877	100	Lp	=59	10·
1	3877	120	Bn	34 (3) v (1) 51	10·
2	3878	90	Bh	51 (1) v (2) 56	10·
5	3881	32	Ca	62 (2) v (1) 67	11·
5	3881	18	Sg	54 (1) v (1) 63	10·
7	3883	,,	,,	54 (1) v (1) 63	10·
9	3885	120	Bn	59 (2) v (1) 67	11·
11	3887	60	D	64−2, 67+1	11·
11	3887	18	Sg	=58	10·
11	3887	90	Bh	=56, =59	10·
14	3890	,,	,,	59−1, 62−1	11·
17	3893	94	Ni	62 (4) v (1) 67	11·
20	3896	120	Bn	67−1	11·
20	3896	90	Bh	62 (1) v (1) 87	11·
24	3900	62	Wf	62−5, 75+2	11·
25	3901	90	Bh	87+1	11·
27	3903	120	Wi	76+1, 87+5	11·
29	3905	90	Bh	87+1	11·
May					
3	3909	,,	,,	=87	11·
5	3911	,,	,,	=87	11·
5	3911	94	Ni	=87	11·
5	3911	157	Wf	=87, 92+2	12·
5	3911	120	Bn	87 (2) v (1) 92	12·
7	3913	134	Sa	=87	11·
11	3917	150	Wf	87−2, =92	12·
16	3922	90	Bh	87 (1) v (1) 92	12·
22	3928	,,	,,	=92	12·
23	3929	134	Sa	<94	<12·
24	3930	94	Ni	92 (4) v (1) 107	12·
25	3931	120	D	=104	12·
25	3931	157	Wf	=107	12·
27	3933	150	Lp	<94	<12·
27	3933	90	Bh	87−5, 92−2	12·
28	3934	150	Bn	94−2	12·
31	3937	90	Bh	92 (1) v (1) 107, =104	12·
June					
1	3938	157	Wf	107−3, λ+3	13·
3	3940	130	Ma	<110	<13·
4	3941	150	Bh	=107	12·
8	3945	94	Ni	107 (3) v (1·5) μ	13·
11	3948	150	Bh	<107	<12·
18	3955	,,	,,	<107	<12·
23	3960	157	Wf	107−6, =λ	13·
24	3961	90	Bh	<97	<12·
28	3965	231	Wf	λ−1	13·
July					
3	3970	,,	,,	λ−2	13·
4	3971	90	Bh	<104	<12·
4	3971	130	Ma	117−1	13·
6	3973	94	Ni	=μ	13·
7	3974	150	Wf	λ−0·5	13·
9	3976	240	Br	κ−1, λ+1	13·
9	3976	130	Ma	117−1	13·
10	3977	157	Wf	λ−2	13·
11	3978	94	Ni	=μ	13·
11	3978	130	Ma	<117	<13·
18	3985	,,	,,	117−2	13·

May 23, Not visible.
May 25, D, About.
May 27, Lp, Not seen.
June 3, Invisible.
June 11, 18, 24, July 4, Bh, Not seen.
July 6, About. Unsteady. Difficult.
July 11, Ni. Difficult. Ma, Invisible.

(7120) χ CYGNI—*continued.*

1924					
July					
19	3986	130	Ma	117−2·5	13·9
19	3986	90	Bh	=κ, =λ	13·3
21	3988	200	Bn	107−3, =κ	13·1*b*
22	3989	183	Ma	=116	13·5
22	3989	157	Wf	107−5, =λ	13·4
23	3990	90	Bh	<107	<12·8
24	3991	130	Ma	116−2	13·7
26	3993	94	Ni	μ+1	13·3
26	3993	150	Bh	=κ, =λ	13·3
27	3994	157	Wf	107−4, λ+1	13·3
29	3996	130	Ma	116−1	13·6
30	3997	,,	,,	116−2, 117−1	13·7
30	3997	150	Bh	107−3	13·1
31	3998	130	Ma	=116	13·5*b*
Aug					
4	4002	157	Wf	=107	12·8
5	4003	150	Bn	107+0·5	12·8
5	4003	,,	Lp	<107	<12·8*b*
7	4005	130	Ma	117+1	13·5
8	4006	120	D	104−2	12·9*b*
9	4007	150	Bh	=107, =κ	13·0
15	4013	90	,,	=107	12·8
16	4014	120	Br	97−2, 104+2	12·2
18	4016	130	Ma	=87	11·9
22	4020	157	Wf	87 (1) v (1) 92	12·1
24	4022	79	Ma	87+1	11·8
25	4023	90	Sa	<87	<11·9
27	4025	60	D	=76	11·5
27	4025	62	Wf	87−1, 92+2	12·0
27	4025	90	Bh	87−1	12·0*b*
31	4029	100	Lp	62 (2) v (2) 87	11·5*b*
Sept					
2	4031	121	Ha	59 (4) v (1) 67	11·2
2	4031	90	Bh	62 (2) v (1) 87	11·6
3	4032	,,	,,	62 (1) v (1) 87	11·5
3	4032	62	Wf	62−5, 75+1	11·5
7	4036	157	,,	64−1, 67+1	11·2
8	4037	90	Sa	=67	11·3
8	4037	,,	Bh	56−1, 59−2	11·0
9	4038	121	Ha	62 (1) v (4) 67	11·1
9	4038	79	Ma	59−2, 62−1·5	11·1
11	4040	100	Lp	67 (2) v (2) 74	11·5
12	4041	120	D	64−2, 67+1	11·3
14	4043	94	Ni	62 (3) v (3) 67	11·2
14	4043	90	Bh	=51	10·5*b*
14	4043	120	Bn	59 (3) v (1) 67	11·2
16	4045	80	Ca	62 (2) v (1) 67	11·2
17	4046	64	Sa	=67	11·3
17	4046	90	Bh	34−3, 51+2	10·4
19	4048	60	D	62−1, 64+1	11·0
22	4051	100	Lp	=58	10·9*b*
22	4051	79	Ma	51−1, 62+1	10·8*b*
23	4052	60	D	58−1, 64+1	11·0
23	4052	90	Bh	34−2, 51+3	10·4
24	4053	,,	Sa	27−6, =51, 56+3	10·5
26	4055	62	Wf	59−1, 63+2	10·9
26	4055	60	D	=51	10·5
26	4055	90	Bh	34−1	10·2
27	4056	121	Ha	51 (1) v (1) 59	10·7
27	4056	160	Br	51−2, 56+2	10·7
1924					
Sept					
27	4056	32	Ca	=59	10·8
28	4057	60	Kw	29−5, 64+4	10·5*b*
29	4058	T	Bk	=62	11·0*b*
29	4058	90	Bh	=34	10·1
29	4058	79	Ma	58+2	10·7
30	4059	32	Ca	=51	10·5
Oct					
1	4060	90	Bh	20 (1) v (1) 51, 27 (1) v (1) 34	10·0
1	4060	,,	Sa	20−3, 27+1	9·7
1	4060	79	Ma	=27, 51+1, 58+1, 62+2	10·5
1	4060	121	Ha	39 (3) v (2) 51	10·4
3	4062	100	Lp	27 (2) v (2) 34	10·0*b*
3	4062	32	Ca	36 (1) v (2) 51	10·3
5	4064	90	Bh	=27	9·9
5	4064	62	Wf	47+2, 55+5	10·4
6	4065	34	Sa	20−3, =21, 27+2	9·6
8	4067	45	Bh	=27	9·9*b*
9	4068	32	Ca	=36	10·2
11	4070	,,	,,	21 (4) v (2) 36	10·0
11	4070	90	Bh	20 (1) v (1) 27	9·6
12	4071	50	Bn	18 (1) v (1) 27	9·6
12	4071	121	Ha	=27	9·9
12	4071	100	Lp	20 (3) v (2) 27	9·7*b*
13	4072	32	Ca	21 (2) v (4) 36	9·8
15	4074	90	Bh	20 (1) v (2) 27	9·6
15	4074	T	Bk	13−4, =16	9·0
16	4075	62	Wf	18 (1) v (1) 27	9·6
16	4075	32	Ca	=21	9·6
17	4076	45	Br	20−1	9·5
17	4076	100	Lp	=20	9·4*b*
18	4077	32	Ca	=21	9·6
19	4078	121	Ha	20 (2) v (3) 27	9·6
20	4079	79	Ma	27+1	9·8
20	4079	32	Ca	18 (2) v (1) 21	9·5
22	4081	,,	,,	=21	9·6
22	4081	121	Ha	20 (4) v (1) 27	9·8
22	4081	T	Ba	20−5, =27	9·9*b*
23	4082	22	Ni	20 (3) v (1·5) 34	9·9
23	4082	90	Bh	=20	9·4
23	4082	40	D	20−4, 27+2	9·7
23	4082	34	Sa	=18	9·3
23	4082	37	Lp	=18	9·3
24	4083	45	Br	20+2	9·2
24	4083	32	Ca	18 (1) v (2) 21	9·4
25	4084	,,	,,	18 (2) v (1) 21	9·5
26	4085	,,	,,	=18	9·3
27	4086	86	Ha	20 (2) v (3) 27	9·6
28	4087	32	Ca	=18	9·3
30	4089	,,	,,	=18	9·3
30	4089	86	Ha	13 (2) v (3) 18	8·9
30	4089	90	Bh	7 (1) v (2) 20	8·5
31	4090	32	Ca	16 (2) v (1) 18	9·2
Nov					
1	4091	,,	,,	16 (1) v (2) 18	9·1
2	4092	,,	,,	13 (2) v (1) 16	8·9
3	4093	,,	,,	13 (1) v (2) 16	8·8
3	4093	22	Ni	13 (2) v (1) 20	9·2
3	4093	90	Bh	7−1	8·2
3	4093	34	Sa	=7	8·1
3	4093	50	Bn	6 (2) v (1) 7	7·9

July 23, Not seen.
July 26, Bh, Glimpsed.
July 31, About. Rather hurried.
Aug. 5, Lp, Not seen.
Aug. 25, Not visible.
Aug. 31, Difficult.

Sept. 28, T.
Oct. 20, Ma, Reddish.
Oct. 23, Ni, Unsteady.

(7120) χ CYGNI—*continued.*

1924 Nov					
3	4093	45	Br	6−4, 7+2	7·9
4	4094	68	Ha	7 (2) v (3) 13	8·3
4	4094	75	Lp	13 (2) v (2) 18, =16	9·0*b*
4	4094	79	Ma	7+0·5	8·1
4	4094	60	D	9−4, 20+6	8·8
4	4094	34	Li	6 (8) v (2) 7	8·0
5	4095	90	Bh	7+1	8·0
5	4095	32	Ca	=13	8·7
6	4096	68	Ha	7 (2) v (3) 9	8·2
6	4096	50	Ma	6 (4) v (1) 7, 7+1, 13+3, 16+2	8·2
6	4096	34	Li	6 (6) v (4) 7	7·9
8	4098	45	Bh	6 (2) v (1) 7	7·9
8	4098	40	D	6 (4) v (1) 9, 9+2·5	8·2
9	4099	22	Ni	6 (4) v (0·5) 7	8·0
9	4099	32	Ca	6 (3) v (3) 7	7·8
10	4100	,,	,,	6 (2) v (5) 7	7·7
10	4100	50	Bn	6 (2) v (1) 7	7·9
10	4100	34	Li	6 (1) v (9) 7	7·6
10	4100	90	Bh	=6	7·5
10	4100	60	Kw	6−1, 7+4	7·7*b*
11	4101	32	Ca	=6	7·5
12	4102	,,	,,	6+2	7·3
12	4102	34	Sa	=6	7·5
14	4104	68	Ha	3 (3) v (2) 6	7·1
14	4104	32	Ca	3 (7) v (4) 6	7·1
14	4104	T	Bk	=6	7·5
15	4105	90	Bh	6+3	7·2
15	4105	22	Ni	0 (5) v (2) 6	7·5
16	4106	,,	,,	0+1·5	7·2
16	4106	B	Co	6+3	7·2
16	4106	79	Ma	6+2	7·3
16	4106	68	Ha	4 (2) v (3) 6	7·1
17	4107	50	Bn	6+3	7·2
17	4107	34	Li	4 (5) v (5) 5	7·1
19	4109	45	Bh	3 (1) v (1) 6	7·0
20	4110	32	Ca	3 (3) v (6) 0	6·7
22	4112	B	,,	3 (3) v (6) 0	6·7
23	4113	,,	,,	3 (2) v (7) 0	6·6
24	4114	45	Bh	2−5, =3	6·5
27	4117	B	Bg	3 (1) v (3) 4	6·5
27	4117	,,	Ni	3+0·5	6·4
27	4117	t	Bk	=3	6·4
27	4117	60	Kw	2 (1) v (2) 6	6·6*b*
27	4117	45	Bh	2 (1) v (1) 3	6·2
27	4117	B	Co	2−1·5, =3	6·3
27	4117	,,	Ma	=3	6·4
27	4117	75	Lp	3 (1) v (4) 6	6·6*b*
27	4117	25	Bn	3 (4) v (1) n	6·8
28	4118	34	Sa	=2	6·1
29	4119	90	Bh	=2	6·1*b*
29	4119	B	Ca	3 (2) v (7) 0	6·6
30	4120	,,	,,	3 (1) v (8) 0	6·5
30	4120	50	Bn	2 (2) v (1) 3	6·3
30	4120	B	Ha	2 (2) v (3) 3	6·2
30	4120	,,	Ma	3+1	6·3*b*
30	4120	34	Sa	=3	6·4*b*
30	4120	30	D	3+1	6·3
30	4120	34	Li	=2	6·1
30	4120	B	Co	2−0·5, 3+3	6·1
30	4120	,,	Ni	g (5) v (1) 3	6·3
Dec					
2	4122	45	Bh	2+3, 3+5	5·8
3	4123	B	Ca	=3	6·4
3	4123	,,	Ma	=3	6·4
3	4123	,,	Ha	2 (1) v (4) 3	6·2
4	4124	t	Bk	=2, 3+4	6·0
5	4125	50	Bn	2 (2) v (1) 3	6·3
5	4125	B	Co	2−0·5, 3+3	6·1
5	4125	75	Lp	=2	6·1
5	4125	B	Ca	=3	6·4
5	4125	,,	Ni	=3	6·4
6	4126	45	Bh	2 (1) v (2) 3	6·2
6	4126	34	Li	1 (7) v (3) g	5·4
6	4126	F	Bg	g (2) v (1) 2	5·9
6	4126	B	Ma	3+1	6·3
6	4126	,,	Ha	2 (2) v (3) 3	6·2
6	4126	,,	D	2−3	6·4
7	4127	,,	,,	2−3, 3+1	6·3
7	4127	,,	Ma	2 (1) v (1) 3	6·2
9	4129	45	Bh	2+2	5·9
9	4129	34	Li	1 (8) v (2) g	5·5
9	4129	B	Ma	2 (2) v (1) 3	6·3
9	4129	,,	Ha	2 (1) v (4) 3	6·2
9	4129	25	Bn	g (4) v (1) 2	6·0
9	4129	B	Ca	2 (2) v (1) 3	6·3
12	4132	,,	,,	2 (1) v (2) 3	6·2
13	4133	,,	,,	2 (2) v (1) 3	6·3
13	4133	34	Li	g (8) v (2) 2	6·0
14	4134	25	Bn	2 (1) v (2) 3	6·2
14	4134	B	Ha	2 (1) v (4) 3	6·2
14	4134	,,	Bg	=3	6·4
14	4134	45	Bh	2+2	5·9
14	4134	B	Co	=2, 3+3	6·0
14	4134	,,	Ni	=3	6·4
14	4134	,,	Ma	2 (2) v (1) 3	6·3
15	4135	,,	,,	2 (1) v (1) 3	6·3
16	4136	,,	Ca	2 (2) v (1) 3	6·3
16	4136	,,	Sa	2−4, 3+1	6·1
17	4137	,,	Ha	2 (1) v (1) 3	6·3
18	4138	,,	Ca	2 (2) v (1) 3	6·3
19	4139	45	Bh	2+2, 3+5	5·9
20	4140	B	Ca	2−3, =3	6·0
20	4140	,,	Co	2−1, 3+3·5	6·0
20	4140	,,	Lp	2 (2) v (2) 3	6·3
20	4140	,,	Ha	2 (2) v (3) 3	6·2
20	4140	,,	Sa	=3	6·4
21	4141	,,	,,	2−2, 3+1	6·3
22	4142	,,	Bg	2 (4) v (1) 3	6·2
22	4142	45	Bh	2+2, 3+5	5·9
22	4142	B	Ni	g (4) v (1) 3	6·3
22	4142	32	Ca	2−3, =3	6·0
23	4143	B	,,	3 (1) v (8) 0	6·5
23	4143	,,	D	3−1	6·4
24	4144	,,	,,	3−2	6·0
24	4144	25	Bn	2 (3) v (1) 3	6·3
24	4144	B	Ma	2 (1) v (4) 3	6·2
24	4144	,,	Co	=2, 3+4	6·0
25	4145	,,	Lp	2 (2) v (2) 3	6·3

Nov. 4, Ma, Pale red.
Nov. 6, Ma, Dull red.
Nov. 10, Kw, T.
Nov. 14, Bk, With t, 7·5.
Nov. 16, Ni, With B, 7·2. Ma, Pale orange.
Nov. 27, Kw, T. Ma, With 50, Pale orange.
Nov. 30, Sa, With B, 6·6.
Nov. 30, D, With B, 6·4.

Dec. 5, Lp, Very red. Ca, Difficult.
Dec. 13, Li, With B, 6·2.
Dec. 14, Ma, Rich orange with touch of red; almost coppery.
Dec. 22, Ca, With B, 6·4.

(7120) χ CYGNI—*continued.*

1924 Dec					
26	4146	25	Bn	2 (2) v (1) 3	6·3
26	4146	B	Ha	2 (1) v (1) 3	6·2
26	4146	,,	Sa	2−3, 3+1	6·3
26	4146	F	Bh	g (1) v (1) 2	5·8
26	4146	B	Ma	2 (1) v (3) 3	6·2
28	4148	,,	,,	2 (1) v (1) 3	6·2
28	4148	,,	Ni	3−1	6·5
28	4148	,,	D	=2	6·1

Dec. 28, Ma, With 79, Orange red.

1924 Dec					
30	4150	B	D	=2	6·1
30	4150	,,	Ha	2 (1) v (1) 3	6·2
30	4150	,,	Lp	=2	6·1*b*
30	4150	,,	Bg	=3	6·4*b*
31	4151	22	Ni	g (3) v (3) 3	6·0
31	4151	F	Bh	=g, 2+5	5·6
31	4151	B	Ma	2 (3) v (2) 3	6·3

Dec. 31, Ni, With B, 6·6. Ma, With 79, Pale bronzy-red.

(7045) R CYGNI. (V. 1.)

H.D. 193449.

Date.	Julian Date.	Inst.	Observer.	Comparisons.	Deduced Mag.
1920 Jan					
1	2325	30	Tn	4+3	8·3
4	2328	,,	,,	2 (8) v (2) 4	8.2*c*
4	2328	79	Ma	14+8	9·1
5	2329	30	Bn	4+1	8·5
8	2332	,,	,,	3 (5) v (1) 4	8·6
8	2332	40	Th	4−1	8·7*b*
9	2333	22	Ni	3 (5) v (3) 5	8·8
9	2333	30	D	4+2	8·4*b*
13	2337	62	Th	4−3	8·9*b*
15	2339	30	Tn	2 (7) v (3) 4	8·0
15	2339	45	Br	=4	8·6
16	2340	30	Bn	3 (3) v (1) 4	8·6
19	2343	,,	,,	3 (2) v (1) 4	8·5
21	2345	79	Ma	6+2, 14+10	8·9
22	2346	30	D	4+2	8·4*b*
23	2347	22	Ni	3 (4) v (5) 5	8·8
24	2348	62	Th	=3	8·4*b*
24	2348	30	Bn	3 (4) v (1) 4	8·6
30	2354	,,	Tn	2 (8) v (2) 4	8·2
31	2355	62	Th	3+2	8·2
31	2355	30	Bn	3−3, 4+1	8·6
Feb					
6	2361	22	Ni	3 (4) v (2·5) 5	8·8
6	2361	79	Ma	2 (3) v (2) 14	8·6*b*
8	2363	50	Bn	4 (1) v (2) 5	8·8
8	2363	62	Th	=4	8·6*b*
8	2363	79	Ma	2 (3) v (2) 14	8·6
16	2371	30	D	4−4, 5+1	9·0
17	2372	45	Br	4−2, 5+2	8·8
17	2372	22	Ni	3 (5) v (3) 5	8·8
21	2376	45	Br	=4	8·6
23	2378	22	Ni	3 (6) v (1) 5	9·0
28	2883	,,	,,	5+0·5	9·0
Mar					
6	2390	50	Bn	4 (5) v (2) 5	8·9
16	2400	62	Th	5−3, 14+5	9·4
18	2402	60	D	8−1, 14+4	9·5*b*
18	2402	50	Bn	=6	9·1

Feb. 8, Ma, Dull red.
Mar. 18, D, Difficult.

Date.	Julian Date.	Inst.	Observer.	Comparisons.	Deduced Mag.
1920 Mar					
21	2405	22	Ni	=10	9·6*b*
23	2407	60	D	8−4, 14+1	9·8
Apr					
10	2425	94	Ni	10 (2) v (4) 14	9·7
11	2426	60	D	14−4	10·3
13	2428	157	Th	14+2	9·7
16	2431	94	Ni	10 (2) v (3) 14	9·7
19	2434	160	Br	14−2	10·1*b*
21	2436	75	Bn	23 (3) v (1) 30	10·5
21	2436	62	Th	=14	9·9*b*
23	2438	60	D	31+1	10·8*b*
29	2444	157	Th	14−2	10·1*b*
May					
4	2449	62	,,	=14	9·9
4	2449	94	Ni	14 (3) v (3) 31	10·4
7	2452	120	Br	14−3	10·2
7	2452	,,	Bn	31 (1) v (2) 35	11·1
7	2452	,,	D	32−2	11·2
9	2454	157	Th	14−3	10·2
10	2455	94	Ni	14 (3) v (3) 31	10·4
10	2455	60	D	=32	11·0
14	2459	150	Bn	35 (1) v (3) 39	11·4
16	2461	94	Ni	=31	10·9
21	2466	160	Br	=36	11·4
21	2466	120	Bn	35 (2) v (1) 39	11·5
22	2467	79	Ma	14 (9) v (1) 36	11·2
23	2468	94	Ni	31 (2) v (4) 38, =36	11·2
June					
5	2481	120	Br	36−3, 59+4	11·7
6	2482	,,	Bn	35 (4) v (1) 41	11·7
7	2483	79	Ma	=36	11·4*b*
7	2483	157	Th	32 (1) v (1) 35	11·2*b*
8	2484	94	Ni	36 (4) v (2) 38	11·5
13	2489	79	Ma	36 (1) v (1) 56	11·9
15	2491	157	Th	=39	11·6*b*
19	2495	120	Br	=56, =59	12·2
19	2495	,,	Bn	41 (1) v (1) 45	11·8
July					
9	2515	94	Ni	59 (4) v (1) x	12·6

April 10, With 22, 9·9.
April 23, Difficult.

(7045) R CYGNI—*continued.*

1920 July					
15	2521	150	Bn	56 (4) v (1) x	12·7
16	2522	94	Ni	x (1) v (4) z	12·9*b*
17	2523	120	Br	=x	12·8
26	2532	,,	,,	x−2·5, z+5	13·0
27	2533	94	Ni	59 (4) v (1) x	12·6
Aug					
4	2541	,,	,,	x (2) v (4) z	13·0
22	2559	250	Th	z+5	13·0
29	2566	183	Ma	<56	<12·4
Sept					
6	2574	,,	,,	K−5	13·4
6	2574	150	Tn	=z	13·5
8	2576	,,	,,	=z	13·5
9	2577	94	Ni	z−1	13·6
11	2579	120	Br	z−3	13·8
13	2581	150	Tn	z+2	13·3
15	2583	,,	,,	=z	13·5
16	2584	94	Ni	z−3	13·8
26	2594	240	Br	<z	<13·5
30	2598	150	Tn	<60	<13·1*b*
Oct					
1	2599	240	Br	z−3	13·8
1	2599	94	Ni	z−2·5	13·8
7	2605	,,	,,	z−4	13·0
7	2605	240	Br	z−4	13·0*b*
11	2609	183	Ma	<x	<12·8
12	2610	150	Tn	<60	<13·1*b*
18	2616	240	Br	<z	<13·5
18	2616	94	Ni	z−2·5	13·8
24	2622	183	Ma	<x	<12·8
30	2628	120	Br	x−4	13·2*b*
30	2628	183	Ma	<x	<12·8
Nov					
1	2630	94	Ni	x (4) v (2) z	13·3
2	2631	200	Bn	60+1	13·0
6	2635	94	Ni	=x	12·8
11	2640	183	Ma	56−1	12·5
15	2644	120	Br	56+2, 59+2	12·0
16	2645	79	Ma	=43	11·8
18	2647	183	,,	35 (1) v (1) 39, 50+2	11·6
18	2647	94	Ni	38−1, 50+2, 56+4	11·9
21	2650	120	Bn	35 (3) v (1) 39	11·6
21	2650	150	Tn	=39	11·6*b*
21	2650	79	Ma	=39	11·4
26	2655	94	Ni	25 (4) v (2) 31	10·8*b*
Dec					
1	2660	120	Br	14+1	9·8
1	2660	50	Bn	23 (2) v (1) 30	10·5
1	2660	60	Tn	=31	10·9
2	2661	94	Ni	14+0·5	9·8
3	2662	79	Ma	14+1·5	9·7
4	2663	60	Tn	=30	10·5
5	2664	,,	,,	14−2	10·1
8	2667	,,	,,	=14	9·9
9	2668	95	Bn	14 (1) v (1) 16	10·0
9	2668	79	Ma	=14	9·9
1920 Dec					
16	2675	50	Ma	6 (11) v (1) 11, 11+1	9·1
21	2680	30	Bn	=5, 6+1	9·1
22	2681	60	Tn	6 (5) v (5) 11	9·1
25	2684	45	Br	4−2, 5+2	8·9
27	2686	60	Tn	=6	9·1
28	2687	30	Bn	4 (4) v (1) 6	9·1
1921 Jan					
1	2691	60	Tn	4 (7) v (3) 5	8·9
2	2692	50	Ma	6 (1) v (3) 11, 14+4	9·1
4	2694	60	Tn	4 (5) v (5) 5	8·9
6	2696	30	,,	4 (5) v (5) 5	8·9
7	2697	70	Ma	2 (1) v (1) 14	8·9
12	2702	30	Bn	=4	8·9
13	2703	,,	Tn	2 (8) v (2) 4	8·9
14	2704	50	Ma	2 (1) v (1) 14	8·9
14	2704	45	Br	3−1, 4+2	8·9
14	2704	22	Ni	3 (3) v (3) 5	8·9
16	2706	30	Tn	2 (8) v (2) 4	8·9
16	2706	60	D	2 (5) v (1) 4, 4+3	8·9
18	2708	50	Ma	2 (1) v (2) 5	7·9
19	2709	,,	,,	2 (1) v (1) 5	7·9
22	2712	25	Bn	C+2	8·0
25	2715	32	Ca	=f	7·9
31	2721	25	Bn	2 (2) v (1) g	7·9
Feb					
2	2723	70	Ma	z−1	6·9
3	2724	100	Br	z−1	6·9
5	2726	70	Ma	z−0·5	6·9
9	2730	,,	,,	=z	6·9
16	2737	22	Ni	=f	7·9
16	2737	32	Ca	d−3, f+3	6·9
17	2738	30	Bn	2 (1) v (1) g	6·9
26	2747	25	,,	2 (1) v (3) g	6·9
Mar					
1	2750	30	,,	2 (1) v (3) g	6·9
2	2751	22	Ni	f (3) v (2) A	7·9
12	2761	,,	,,	f (5) v (0·5) A	7·9
14	2763	32	Ca	=f	7·9
14	2763	30	Bn	2 (4) v (1) g	7·9
18	2767	,,	,,	g+1	7·9
18	2767	22	Ni	=A	7·9
23	2772	32	Ca	h−1, k+4	7·9
24	2773	25	Bn	g−1	7·9
29	2778	22	Ni	3 (2) v (4) 5	8·0
Apr					
1	2781	,,	,,	A (2) v (2) 3	8·0
3	2783	30	Bn	g (3) v (1) A	7·9
3	2783	,,	D	4−3, 5+2	8·0
4	2784	32	Ca	h−3, k+2	7·9
12	2792	22	Ni	3 (2·5) v (5) 5	8·0
12	2792	30	Bn	g (4) v (1) A	7·9
15	2795	45	Br	3−1, 4+3	8·0
15	2795	32	Ca	l−1, 4+1	8·0
15	2795	30	D	4−2, 5+4	8·9
27	2807	,,	,,	4−4, 5+1	9·0
27	2807	22	Ni	3 (4) v (2) 5	8·8
28	2808	45	Br	4+1	8·9
28	2808	30	Bn	4 (1) v (2) 5	8·8
30	2810	,,	D	4−5, 5+1	9·0
May					
8	2818	50	Bn	4 (3) v (2) 5	8·9
10	2820	32	Ca	=m	8·8
12	2822	22	Ni	5 (1) v (1) 10	9·3

Aug. 22, With 8-in. OG at Headley.
Sept. 6, Tn, Glimpsed.
Sept. 15, Glimpsed.
Sept. 30, Oct. 11, 12, Invisible.
Oct. 24, Not seen.
Oct. 30, Ma, Not seen.
Dec. 2, Ni, With 22, 10·2.
Dec. 3, Reddish.
Dec. 9, Ma, Pale red.
Dec. 16, Reddish. Jan. 7, Slightly red.
Feb. 2, Very pale red.

(7045) R CYGNI—*continued.*

1921 May					
16	2826	30	D	14+6	9·3*b*
19	2829	50	Bn	4 (2) v (1) 5	8·9
23	2833	,,	,,	4 (2) v (1) 6	9·0
26	2836	22	Ni	10 (3) v (4) 14	9·7
29	2839	60	D	14+1·5	9·7
June					
1	2842	45	Br	5+1	9.0
1	2842	32	Ca	=6	9·1*b*
5	2846	60	D	14+2	9·7
6	2847	50	Bn	5 (1) v (2) 8	9·2
6	2847	22	Ni	10 (5) v (1) 14	9·8
11	2852	50	Ma	6 (1) v (1) 11, 14+3	9·5
11	2852	,,	Bn	6 (3) v (1) 9	9·5
16	2857	60	D	14−1	10·0*b*
23	2864	50	Bn	11 (3) v (1) 14	9·8
24	2865	60	D	14 (1) v (4) 30, 14−2	10·0
26	2867	79	Ma	14+0·5	9·8
27	2868	160	Br	14+2	9·7
28	2869	50	Bn	11 (4) v (1) 14	9·8
28	2869	80	Ca	16−2, 30+3	10·2*b*
29	2870	60	D	14−3·5, 30+2·5	10·3
July					
2	2783	79	Ma	14−2	10·1
2	2873	94	Ni	14+1	9·8
5	2876	50	Bn	14 (2) v (1) 16	10·0
8	2879	,,	,,	14−2, 16+1	10·0
8	2879	94	Ni	14+1·5	9·7*b*
9	2880	60	D	14−3, 30+3	10·2
13	2884	,,	,,	14−4, 30+2	10·3
25	2896	120	Bn	31 (4) v (1) 35	11·2
Aug					
1	2903	80	Ca	31−3, 35+1	11·2
2	2904	120	Bn	35 (1) v (1) 41	11·5*b*
17	2919	94	Ni	36 (4) v (1·5) 38	11·5
28	2930	,,	,,	56−1, 59+1	12·2
30	2932	160	Br	56+3, 59+3	11·9
Sept					
1	2934	120	D	56−2	12·6
6	2939	,,	,,	56−5, 60+3	12·9*b*
6	2939	94	Ni	59 (2) v (2) x	12·4
10	2943	120	Br	=x	12·8
18	2951	150	Tn	=59	12·1
20	2953	,,	,,	=56	12·4*b*
22	2955	94	Ni	59 (4) v (1) x	12·6
22	2955	150	Bn	56 (4) v (1) x	12·7
25	2958	120	Br	x−3, z+5	13·1
25	2958	183	Ma	x−2	13·0
27	2960	150	Bn	x+1·5	12·6
Oct					
4	2967	,,	,,	x (1) v (2) 60	12·9
4	2967	183	Ma	x−2	13·0
6	2969	94	Ni	x (4) v (4) z	13·2
8	2971	200	Bn	x (1) v (4) 60	12·8
14	2977	120	Br	z+2	13·3*b*
19	2982	150	Tn	60−2	13·3*b*
23	2986	,,	,,	=60	13·1
23	2986	120	Br	=z	13·5
23	2986	150	Bn	<60	<13·1
23	2986	183	Ma	x−5	13·3
28	2991	,,	,,	Estimated	<12·7

Aug. 2, t.
Sept. 1, Difficult.
Oct. 14, About. Difficult.
Oct. 19, Glimpsed.
Oct. 23, Bn, Glimpsed.
Oct. 28, Invisible.

1921 Nov					
2	2996	94	Ni	=z	13·5
6	3000	240	Br	z−3, a+1	13·8
6	3000	150	Tn	60−3	13·4
7	3001	,,	,,	z+1	13·4
15	3009	183	Ma	Estimated	<12·7
21	3015	80	Ca	<56	<12·4
22	3016	94	Ni	x (6) v (1) z	13·4*b*
26	3020	,,	,,	x (5) v (1) z	13·4
27	3021	120	Br	<x	<12·8
Dec					
3	3027	240	,,	z−2·5	13·8
3	3027	150	Tn	<60	<13·1
3	3027	94	Ni	z−1	13·6*b*
12	3036	183	Ma	Estimated	<12·7
20	3044	150	Bn	<x	<12·8
23	3047	240	Br	z−3, a+1	13·8
24	3048	94	Ni	z−1·5	13·7
28	3052	,,	,,	z−2	13·7*b*
29	3053	85	Bn	<x	<12·8
1922					
Jan					
3	3058	240	Br	z−1	13·6
10	3065	T	Ma	Estimated	<12·7
17	3072	120	Bn	<56	<12·4
22	3077	,,	Br	<x	<12·8*b*
23	3078	94	Ni	x (3) v (2) z	13·2
Feb					
7	3093	T	Ma	Estimated	<12·7
25	3111	94	Ni	38 (2·5) v (1·5) 50	11·9
25	3111	60	D	<33	<11·1
27	3113	80	Ca	30−4, =31	10·9
Mar					
17	3131	94	Ni	10 (3) v (2) 14	9·8
21	3135	32	Ca	11+2	9·4
21	3135	50	Bn	11 (2) v (1) 14	9·8
28	3142	,,	,,	4 (2) v (1) 5	8·9
29	3143	22	Ni	3 (6) v (1) 5	9·0
31	3145	45	Br	4−1, 5+3	8·7
Apr					
1	3146	50	Bn	4 (1) v (1) 5	8·8
16	3161	22	Ni	=3	8·4
19	3164	32	Ca	g−2, h+1	7·4
19	3164	30	Bn	g (1) v (3) A	7·4
29	3174	,,	,,	e (2) v (1) g, =f	7·1
29	3174	160	Br	2−5	7·1
30	3175	32	Ca	g−1, h+2	7·3
May					
13	3188	160	Br	2−2	6·8
14	3189	30	Bn	2 (1) v (1) g	6·9
19	3194	32	Ca	g−2, h+1	7·4
20	3195	31	D	2 (1) v (7) 4, 2−3	6·9
21	3196	22	Ni	f (4) v (2) A	7·6*b*
23	3198	25	Bn	f (2) v (1) g	7·2
25	3200	45	Br	2−3	6·9
27	3202	22	Ni	A+1	7·7*b*
June					
1	3207	,,	,,	=A	7·8
1	3207	30	Bn	g−1	7·3
4	3210	,,	,,	g (1) v (4) A	7·4
17	3223	62	Wf	2 (1) v (1) 5, 4+5	7·9*c*
22	3228	32	Ca	k−2, l+2	8·2

Nov. 27, Jan. 22, Not seen.
Dec. 3, Br, Difficult. Tn, Invisible.
Jan. 10, Feb. 7, Various powers used.
Jan. 17, t, Not seen.
Mar. 17, With 22, 9·6.

(7045) R CYGNI—*continued.*

1922 June 29	3235	45	Br	3 −2, 4 +2	8·5
July 1	3237	32	Ca	k 2, 1 +2	8·2
2	3238	62	Wf	4 +3, 5 +7, 6 +8	8·3
12	3248	22	Ni	5 +0·5	9·0
17	3253	32	Ca	m 2, 6 +1	9·0
18	3254	50	Bn	4 (2) v (1) 5	8·9
21	3257	45	Br	4 −2, 5 +2	8·8
21	3259	62	Wf	5 +1, 6 +3	8·9
30	3266	150	,,	11 +2, 14 +6	9·4
30	3266	45	Br	−5, −6	9·1
Aug. 7	3274	22	Ni	10 (4) v (2·5) 14	9·8*b*
13	3280	62	Wf	−14	9·9
17	3284	94	Ni	14 −3·5	10·2
19	3286	160	Br	14 +2	9·7
21	3288	62	Wf	11−2, 14+1	9·8
23	3290	30	Bn	16 (1) v (1) 23	10·2
27	3294	94	Ni	14 −2	10·1
Sept. 7	3305	150	Wf	14 −5, −30	10·5
10	3308	94	Ni	14 (1·5) v (3) 31	10·2
13	3311	150	Wf	−30	10·5*b*
15	3313	160	Br	31 1, 35+2	11·1
20	3318	30	Bn	23 (2) v (1) 30	10·5
20	3318	70	Ma	14−4, =36	10·8
23	3321	157	Wf	−31	10·9
26	3324	70	Ma	−36	11·4
Oct. 8	3336	150	Wf	35 3, −39	11·6
13	3341	94	Ni	38 (3) v (1) 50	12·0
14	3342	120	Br	50 +2	11·9
14	3342	,,	Bn	41 (1) v (1) 45	11·8
15	3343	157	Wf	30 3, 56 +4	12·0
21	3349	94	Ni	38 (2) v (1) 50	11·9
22	3350	120	Bn	41 (3) v (1) 45	11·9
27	3355	94	Ni	50 (1) v (1) 56	12·2
Nov. 11	3370	240	Br	x 2	13·0
11	3370	231	Wf	56−2, x+1	12·6
12	3371	94	Ni	59 (2) v (2) x	12·4
13	3372	183	Ma	=56, =59	12·2*b*
15	3374	150	Bn	56 (3) v (1) x	12·7
18	3377	,,	,,	56 (4) v (1) x	12·7
21	3382	180	Ma	x−1	12·9
24	3383	150	Bn	x (1) v (3) 60	12·8
26	3385	94	Ni	x (4) v (2) z	13·3
Dec. 8	3397	..	..	x (1) v (3) z	13·2
11	3400	240	Br	x −4, z+4	13·2
21	3410	94	Ni	x (5) v (1·5) z	13·4
30	3419	..	..	x (4) v (2) z	13·3
1923 Jan. 4	3424	240	Br	<x	<12·8*b*
9	3429	180	Ma	<56	<12·4
10	3430	103	Li	<60	<13·1
12	3432	183	Ma	<56	<12·4
15	3435	94	Ni	Estimated	<13·6

Aug. 17, With 22, 9·9.
Aug. 27, With 22, 9·7.
Nov. 13, Glimpsed. Difficult.
Nov. 23, Very difficult.
Jan. 4, Not seen
Jan. 9, 12, Invisible.
Jan. 15, Not seen

1923 Jan. 16	3436	94	Ni	z−1	13·6
20	3440	,,	,,	z−2	13·7
20	3440	157	Wf	z−2, a+1	13·8
Feb. 6	3457	94	Ni	Estimated	<13·1
7	3458	120	Br	<x	<12·8
7	3458	157	Wf	=z	13·5
17	3468	94	Ni	x (3) v (2) z	13·2
Mar. 16	3495	,,	,,	=38	11·6
17	3496	120	Bn	36 (1) v (2) 39	11·5
20	3499	94	Ni	14 (5) v (1) 31	10·8
Apr. 3	3513	,,	,,	10 (3) v (3) 14	9·7
6	3516	62	Wf	=11, 14+3	9·6
7	3517	94	Ni	14+4	9·3
9	3519	75	Bn	14+0·5	9·3
14	3524	34	Li	4 (9) v (1) 5	9·6
15	3525	62	Wf	=11, 14+2	9·7
15	3525	22	Ni	5−3, =10, 14+3	9·1
23	3533	62	Wf	=6, 11+4	9·2
23	3533	60	D	5−2, 8+2	9·2
24	3534	30	,,	5−2, 8+1	9·2
24	3534	22	Ni	5 (3) v (1) 10	9·2
26	3536	75	Bn	6 (2) v (1) 9	9·2
May 3	3543	45	Br	4−2, 5+2	8·8
4	3544	22	Ni	3 (6) v (1) 5	9·0
5	3545	60	D	4−4, 5+1	9·0
13	3553	30	,,	4−1, 5+4	8·0
17	3557	,,	Bn	2 (2) v (1) g	7·9
20	3560	22	Ni	A+1	7·1
21	3561	25	Bn	2 (5) v (2) g	7·1
21	3561	62	Wf	2 (5) v (5) 4	7·0
24	3564	60	D	2−2	6·8
25	3565	30	Bn	2 (1) v (2) g	6·8
June 4	3575	60	D	2−3	6·6
5	3576	62	Wf	2−1	6·5
6	3577	30	D	2−1	6·5
10	3581	60	,,	2+2	6·5
10	3581	OG	Ph	2−2	6·3
11	3582	30	Bn	2 (1) v (3) g	6·5
18	3589	,,	D	2−1	6·5
23	3594	,,	,,	2−2	6·6
26	3597	60	,,	2−1	6·5
28	3599	62	Wf	2−2	6·6
29	3600	30	D	=2	6·6
July 1	3602	60	,,	=2	6·6
1	3602	OG	Ph	2+1	6·5
2	3603	60	D	2−1	6·5
3	3604	62	Wf	2−1	6·5
4	3605	79	Ma	2−2	6·6
4	3605	22	Ni	f (2) v (2) A	7·1
4	3605	60	D	=2	6·5
5	3606	30	,,	2−2	6·6
6	3607	,,	,,	=2	6·6

Feb. 6, Not seen.
Feb. 7, Br, Not seen.
April 7, With 22, 9·8.
May 13, 7c.
May 24, June 6, 5c.
June 10, D, 7c.
June 18, 6c.
July 4, Ma, Clear brassy red.
July 5, 6, D, 7c.

(7045) R CYGNI—*continued.*

1923 July					
6	3607	50	Bn	d (1) v (1) 2	6·5
7	3608	60	D	2−1	6·7
10	3611	62	Wf	2+3	6·3
10	3611	22	Ni	=f, A+3	7·3*b*
12	3613	30	D	2−1	6·7
13	3614	62	Wf	2−1	6·7
16	3617	30	D	2−2	6·8
20	3621	60	,,	2 (1) v (5) 4, 2−3	7·0
20	3621	50	Bn	2 (2) v (1) g	7·0
21	3622	34	Li	=2	6·6
22	3623	62	Wf	−2	6·6*b*
24	3625	50	Bn	2 (3) v (1) g	7·1
27	3628	60	D	2 (3) v (2) 4	7·8
28	3629	34	Li	2 (2) v (8) 3	7·0
Aug					
1	3633	22	Ni	−A	7·8
3	3635	45	Br	3+4	8·0
3	3635	F	Bn	2 (4) v (1) g	7·1
6	3638	62	Wf	2−3	6·9*b*
8	3640	25	Bn	g (1) v (2) A	7·4
11	3643	30	D	4+3	8·3
12	3644	62	Wf	2−3	7·1*b*
13	3645	25	Bn	A (1) v (3) C	7·9
18	3650	,,	,,	A (1) v (1) C	8·1
24	3656	,,	,,	A (3) v (1) C	8·2
30	3662	,,	,,	3 (2) v (1) 4	8·5
30	3662	62	Wf	5+4, 6+5	8·6
Sept					
1	3664	45	Br	4−4, 5+1	9·0*b*
2	3665	60	D	4−3, 5+2·5	8·9
2	3665	22	Ni	5 (1) v (4) 14	9·2
5	3668	50	Bn	4 (1) v (1) 5	8·8
7	3670	62	Wf	11+2, 14+4	9·5
8	3671	60	D	4−4, 5+2	8·9
8	3671	22	Ni	5 (4) v (1·5) 14	9·5
11	3674	50	Bn	5 (1) v (2) 6	9·1
13	3676	45	Br	5+1	9·0
13	3676	62	Wf	−6, 14+6	9·2
14	3677	60	D	−5	9·1*b*
18	3681	22	Ni	5 (4) v (1·5) 14	9·7
18	3681	60	D	8−2, 14+3	9·6
23	3686	50	Bn	4−4, 5+1, 6+2	9·0
29	3692	45	Br	14+4	9·5
29	3692	62	Wf	6−3, 14+4	9·5
30	3693	60	D	14+1	9·8
30	3693	22	Ni	5 (1) v (4) 14	9·2*b*
Oct					
4	3697	130	Ma	14+2	9·7
8	3701	62	Wf	−14	9·9
12	3705	22	Ni	14+1	9·8
12	3705	79	Ma	6−2, 14+2	9·5
13	3706	60	D	14−2, 30+5	10·1
14	3707	120	Bn	14+3	9·6
14	3707	50	Bn	14 (2) v (1) 16	10·0
21	3714	79	Ma	=14	9·9
22	3715	50	Bn	14−1, 16+1	10·0
23	3716	79	Ma	14+1	9·8
26	3719	94	Ni	14+2·5	9·6
27	3720	150	Wf	14−6, =30	10·5

July 6, Bn, With 30, 6·5.
July 7, D, 7*c*.
July 10, Wf, With B, 6·6.
Sept. 1, About.
Oct. 4, Pale red.
Oct. 12, 21, Ma, Dull red.
Oct. 23, About. Dull red.

1923 Oct					
28	3721	51	Ma	31 (1) v (1) 35	11·1*b*
31	3724	120	Br	14−1	10·0
Nov					
2	3726	,,	D	31−2, 32+1	11·0*b*
4	3728	94	Ni	14 (3) v (2) 31	10·5
6	3730	79	Ma	=36	11·4
7	3731	120	Bn	35 (2) v (1) 39	11·5
10	3734	,,	,,	35 (1) v (2) 39	11·4
10	3734	79	Ma	=36	11·4
10	3734	60	D	36−1, 43+3	11·3
14	3738	94	Ni	31+1	10·8
16	3740	120	Bn	=41, 45+3	11·7
18	3742	79	Ma	31 (2) v (1) 35	11·2
19	3743	120	Br	=35	11·3
30	3754	,,	,,	59+1	12·0
30	3754	150	Wf	36−4, 43+1	11·7
Dec					
2	3756	120	Bn	41 (2) v (1) 45	11·9
3	3757	130	Ma	36 (1) v (1) 36	11·9*b*
4	3758	,,	,,	36 (5) v (1) 56, 56+3	12·1
9	3763	,,	,,	36 (7) v (1) 59	12·0
9	3763	94	Ni	56 (2) v (2) 56	12·2
11	3765	,,	,,	38 (2) v (1) 56	11·9
11	3765	150	Wf	39−5, 59+1	12·1
15	3769	120	Bn	=45	11·9
15	3769	130	Ma	36 (2) v (1) 56	12·1
18	3772	120	Br	59−3, x+3	12·4
23	3777	130	Ma	=56	12·4*b*
28	3782	120	Br	x+2·5	12·5
30	3784	130	Ma	59+1, =56	12·2
30	3784	94	Ni	=59	12·1
1924 Jan					
6	3791	,,	,,	59 (1) v (4) x	12·2
6	3791	120	Br	=x	12·8*b*
6	3791	150	Bn	56 (3) v (1) x	12·7
14	3799	,,	,,	=x	12·8*b*
15	3800	94	Ni	59 (3) v (1) x	12·6
17	3802	300	Wf	=x, 60+4	12·8
23	3808	94	Ni	x (1) v (4) z	12·9
25	3810	120	Br	x−5	13·3*b*
25	3810	150	Bn	x (3) v (1) 60	13·0
27	3812	130	Ma	x−2·5	13·0
27	3812	120	Br	x−3	13·1
Feb					
1	3817	94	Ni	x (4) v (2) z	13·3
1	3817	200	Bn	x (3) v (1) 60	13·0
4	3820	,,	,,	=60	13·1
8	3824	94	Ni	z+1	13·4*b*
8	3824	231	Wf	x−3, =60	13·1*b*
16	3832	200	Bn	−60	13·1
24	3840	120	Br	x−5	13·3
28	3844	94	Ni	−z	13·5*b*
Mar					
5	3850	,,	,,	z−1·5	13·7
8	3853	200	Bn	−60	13·1
9	3854	94	Ni	z−2·5	13·8

Oct. 28, Very difficult.
Nov. 18, Dull red.
Dec. 23, Feb. 24, About.
Dec. 30, Ma, Very difficult.
Jan. 25, Br, About.
Feb. 8, 28, Ni, Difficult. Unsteady.
Feb. 8, Wf, Difficult.
Feb. 16, Seen.
Mar. 8, Not seen.

(7045) R CYGNI—*continued.*

1924						1924					
Mar						July					
29	3874	94	Ni	z−2	13·7	31	3998	86	Ha	6 (2) v (3) 11	9·
Apr						31	3998	60	D	4−4, 5+1	9·
2	3878	,,	,,	z−2	13·7	Aug					
24	3900	231	Wf	z−2, a+2	13·7	2	4000	,,	Ha	5 (2) v (3) 10	9·
27	3903	94	Ni	z−2	13·7	2	4000	50	Bn	3 (4) v (1) 4	8·
May						5	4003	25	,,	3 (3) v (1) 4	8·
4	3910	M	Ph	z−2, a+1·5	13·8	5	4003	42	Si	3 (2) v (3) 5	8·
5	3911	,,	,,	z (1) v (2) a	13·7	6	4004	62	Wf	=4, 6+5	8·
5	3911	94	Ni	z−1	13·6	8	4006	30	Bn	3 (1) v (1) 4	8·
5	3911	200	Bn	z−1	13·6	9	4007	,,	D	4+2	8·
7	3913	231	Wf	z−1, a+3	13·6	10	4008	,,	,,	h−4, k+1	7·
7	3913	94	Ni	z−2	13·7	10	4008	62	Wf	=3, 5+6	8·
12	3918	231	Wf	z+2	13·3	12	4010	25	Bn	3 (1) v (3) 4	8·
19	3925	200	Bn	<x	<12·8	12	4010	42	Si	3 (2) v (3) 5	8·
21	3927	120	D	59−1	13·0*c*	13	4011	60	D	g−6, k+2	7·
23	3929	,,	,,	x−1, 60+3	12·9	16	4014	45	Br	3+2	8·
24	3930	94	Ni	x (4) v (2) z	13·3	18	4016	60	Ha	4 (1) v (1) 5	8·
25	3931	157	Wf	56−5, =x	12·8	19	4017	25	Bn	k−2, C+1, 3+2	8·
25	3931	M	Ph	56 (1) v (3) 60, 56−2	12·6	22	4020	60	Si	=3	8·
26	3932	120	D	x−1, 60+2	12·9	22	4020	62	Wf	2−7·5	7·
27	3933	121	Ha	56 (3) v (2) x	12·6	25	4023	30	Bn	k (1) v (2) C	8·
27	3933	150	Bn	56 (4) v (1) x	12·7	27	4025	62	Wf	2 (2) v (1) 4	8·
30	3936	120	D	56−3, x+2	12·6	27	4025	60	D	g−6, k+2	7·
June						Sept					
1	3938	,,	,,	56−1, x+2	12·5	3	4032	62	Wf	2−10	7·
2	3939	157	Wf	=56, x+3	12·4	5	4034	60	D	g−5, k+3	7·
5	3942	120	D	59−1, 56+2	12·2	9	4038	68	Ha	3 (4) v (1) 4	8·
8	3945	94	Ni	56+1	12·3	11	4040	30	Bn	=k, C+2	8·
12	3949	120	D	59+1	12·0	12	4041	60	D	g−5, k+3	7·
17	3954	,,	,,	36−5, 59+3	11·8	12	4041	22	Ni	3 (1) v (5) 5	8·
20	3957	M	Ph	36 (1) v (3) 59, 36−3	11·6	14	4043	30	Bn	k+1, C+3, 3+4	8·
20	3957	120	Bn	35 (3) v (1) 39	11·6	18	4047	60	D	=k	8·
22	3959	,,	D	36−2, 59+6	11·5	19	4048	,,	,,	k+2	7·
23	3960	150	Wf	36−2, 43+2	11·6	21	4050	45	Br	4−3, 5+2	8·
26	3963	60	D	=36	11·4	22	4051	25	Bn	k (2) v (1) C	8·
27	3964	62	Wf	=36	11·4	22	4051	60	Si	=3	8·
29	3966	60	D	31−5, 36+1	11·4	23	4052	,,	D	k−3, 4+3	8·
30	3967	M	Ph	36+1	11·3	27	4056	30	Bn	k−3, 3+1	8·
July						28	4057	T	Bk	6+2	8·
1	3968	60	D	31−4, 36+2	11·3	29	4058	68	Ha	6 (2) v (3) 11	9·
3	3970	150	Wf	=30	10·5	Oct					
5	3972	60	D	31−3, 36+3	11·2	1	4060	33	Ha	4 (3) v (2) 5	8·
6	3973	94	Ni	14−2	10·1*b*	6	4065	t	Bk	4−2, 6+2, 8+3	9·
7	3974	150	Wf	30−2, 36+5	10·8	8	4067	60	Si	3 (3) v (2) 5	8·
9	3976	60	D	=31	10·9	12	4071	25	Bn	3 (2) v (1) 4	8·
9	3976	120	Br	=14	9·9	14	4073	33	Ha	4 (1) v (4) 5	8·
10	3977	62	Wf	11−5, 14−2	10·1	14	4073	60	Si	=4	8·
10	3977	50	Bn	11 (2) v (1) 14	9·8	14	4073	40	D	4−1, 5+2	8·
11	3978	94	Ni	=14	9·9	15	4074	t	Bk	4−3, =5, 6+1	9·
13	3980	50	Bn	11 (3) v (2) 14	9·8	16	4075	62	Wf	4−2, 6+4	8·
13	3980	60	D	14−2, 30+4	10·1	17	4076	45	Br	5−1	9·
14	3981	121	Ha	10 (4) v (1) 14	9·8	19	4078	50	Bn	4 (1) v (2) 5	8·
19	3986	50	Bn	6 (5) v (2) 11	9·5	20	4079	79	Ma	2 (2) v (1) 14	8·
19	3986	60	Si	=11	9·6	22	4081	t	Ba	4−2, 5+3, 6+3	8·
21	3988	T	Bk	=5, 6+1	9·0*b*	23	4082	50	Bn	4 (2) v (1) 5	8·
22	3989	22	Ni	5 (3) v (3) 14	9·5	23	4082	33	Ha	=5	9·
22	3989	62	Wf	=6, 11+3	9·2*b*	23	4082	40	D	4−1, 5+2	8·
22	3989	60	Si	=11	9·6	24	4083	22	Ni	5 (2) v (2) 10	9·
24	3991	50	Bn	6 (1) v (4) 11	9·2	24	4083	45	Br	=5	9·
24	3991	86	Ha	11 (1) v (4) 14	9·7	24	4083	100	St	14+3·5	9·
27	3994	62	Wf	4−5, 6+1	9·1	24	4083	60	Si	4 (3) v (2) 11	9·
29	3996	50	Bn	4 (2) v (1) 6	9·0	27	4086	33	Ha	11 (1) v (1) 14	9·
29	3996	86	Ha	=5	9·1*b*	27	4086	50	Ma	2 (3) v (1) 14, 6+1, 13+4, 11+7	9·

May 19, Not seen.
May 21, About.
July 6, Difficult. Unsteady.

Oct. 20, Pale red.

(7045) R CYGNI—*continued.*

Date.	Julian Date.	Inst.	Observer.	Comparisons.	Deduced Mag.
1924 Oct					
27	4086	34	Li	4 (5) v (5) 5	8·8
28	4087	60	Si	=7	9·4
Nov					
3	4093	34	Li	4 (3) v (7) 5	8·8
3	4093	45	Br	=5	9·1
3	4093	50	Bn	5+0·5	9·0
4	4094	68	Ha	6 (4) v (1) 11	9·5
4	4094	40	D	4−2, 5+2	8·8
4	4094	22	Ni	=10	9·6
4	4094	50	Ma	6+2	8·9
6	4096	79	,,	6+2	8·9
7	4097	34	Li	4 (7) v (3) 5	8·9*b*
8	4098	40	D	=5	9·1
10	4100	34	Li	4 (6) v (4) 5	8·9
14	4104	40	D	5−4, 14+3	9·5
14	4104	T	Bk	11−1, 14+2	9·7
16	4106	79	Ma	11+1	9·5
16	4106	22	Ni	10 (1) v (3) 14	9·6
17	4107	68	Ha	6 (4) v (1) 11	9·5
17	4107	50	Bn	6 (1) v (3) 9	9·2
17	4107	60	Si	=11	9·6
17	4107	100	St	14+3	9·6
17	4107	34	Li	=5	9·1
27	4117	50	Bn	6 (4) v (1) 9	9·5
27	4117	79	Ma	14+2	9·7*b*
27	4117	T	Bk	14+3	9·6
28	4118	100	St	11+2, 14+3	9·5
1924 Nov					
30	4120	68	Ha	11 (3) v (3) 14	9·8
30	4120	100	Si	=14	9·9
30	4120	60	D	14+1	9·8
30	4120	22	Ni	14+1	9·8
Dec					
3	4123	34	Li	=6	9·1
4	4124	T	Bk	=9, 14+2	9·6
5	4125	68	Ha	=14	9·9
5	4125	50	Bn	6 (4) v (1) 9	9·5
6	4126	79	Ma	11+1, 14+6, 23+2	9·7*b*
6	4126	40	D	14+0·5	9·8
6	4126	34	Li	=6	9·1
7	4127	100	Si	=14	9·9
9	4129	34	Li	6 (5) v (5) 7	9·3
10	4130	68	Ha	14 (1) v (4) 30	10·0*b*
12	4132	,,	,,	11 (3) v (2) 14	9·8
13	4133	34	Li	5 (2) v (8) 8	9·1*b*
14	4134	50	Bn	9 (3) v (1) 14	9·8
16	4136	100	St	14+1·5	9·7
20	4140	68	Ha	11 (1) v (4) 14	9·7
22	4142	94	Ni	14−1·5	10·0
23	4143	40	D	14−3	10·2
26	4146	68	Ha	11 (3) v (2) 14	9·8
28	4148	79	Ma	30 (1) v (1) 29	10·6*b*
28	4148	94	Ni	14 (4) v (3) 31	10·5
30	4150	79	Ma	14+0·5	9·8*b*
30	4150	50	Bn	14−5, 16 (3) v (1) 23	10·3

Oct. 27, Li, 7c. Nov. 4, Ma, Pale red. Nov. 16, Ma, Dull red. Ni, Difficult.

Dec. 4, 5c.

(7220) S CYGNI. (V. 2.)

H.D. 200357.

Date.	Julian Date.	Inst.	Observer.	Comparisons.	Deduced Mag.
1922 June					
21	3227	157	Wf	=91	14·3
July					
23	3259	231	,,	<91	<14·3
30	3266	,,	,,	<91	<14·3
Aug.					
14	3281	,,	,,	<91	<14·3
16	3283	,,	,,	<94	<14·7
21	3288	157	,,	<91	<14·3
23	3290	231	,,	<94	<14·7
Sept					
9	3307	,,	,,	<91	<14·3
16	3314	,,	,,	<91	<14·3
23	3321	157	,,	<91	<14·3
Oct					
1	3339	231	,,	<91	<14·3
6	3344	,,	,,	<91	<14·3
Nov					
10	3369	,,	,,	=91	14·3
1923 Jan					
8	3428	...	Sa	11−10, 26−3, 25−4	10·3
24	3444	...	,,	11−8, 16−4	9·9
Feb					
7	3458	150	Wf	=53	11·1
Apr					
6	3516	,,	,,	...	12·8
14	3524	297	Li	=82	13·3*c*
15	3525	157	Wf	84+4	13·1
23	3533	,,	,,	84−3, 88+1	13·8
May					
7	3547	231	Wf	=91	14·3
21	3561	,,	,,	94−2	14·9
June					
5	3576	,,	,,	<94	<14·7
11	3582	...	Ph	Estimated	<14·0*b*
July					
1	3602	...	,,	,,	<14·0*b*

Aug. 23, Oct. 16, Variable suspected.

April 6, The record is "=128 from H.C.O. chart." 128 not identified—A.N.B.

(7220) S CYGNI—*continued.*

1923 July 3	3604	231	Wf	<94	<14·7
4	3605	M	Ph	91−5	14·8*c*
13	3614	231	Wf	<94	<14·7
25	3626	157	,,	<88	<13·9*b*
Aug 4	3636	OG	Ph	91−5	14·8*b*
5	3637	231	Wf	<94	<14·7
12	3644	157	,,	<94	<14·7
15	3647	OG	Ph	<91	<14·3
30	3662	231	Wf	<94	<14·7
Sept 3	3666	,,	,,	94−2	14·9
5	3668	OG	Ph	91−5	14·8*b*
7	3670	231	Wf	94−3	15·0
8	3671	OG	Ph	...	...
12	3675	300	Wf	92−2, =94	14·7
16	3679	OG	Ph	82 (3) v (1) 91, 82−5	14·0
29	3692	300	Wf	88−2, 91+3	14·0
30	3693	OG	Ph	73 (2) v (1) 82, =77, 82+2	13·1
Oct 8	3701	157	Wf	82−2, 88+3	13·5
12	3705	OG	Ph	73−4, =77, 82+1	13·1
23	3716	...	Sa	<74	<12·7
27	3720	150	Wf	=78, 80+3	12·9
28	3721	OG	Ph	=77, 78−1	13·1*b*
31	3724	157	Wf	78−1, =79	13·1
Nov 3	3727	150	Lp	<78	<13·0*b*
7	3731	...	Sa	=78	13·0
14	3738	150	Lp	<67	<12·4*b*
23	3747	134	Sa	59−3, =67, 78+6	12·3
Dec 2	3756	OG	Ph	53−2, =48, 59+4	11·3
3	3757	90	Sa	38−3, =44, 50+3	11·2
11	3765	150	Wf	26−6, 38+2	10·6
14	3768	90	Sa	22−2, 26−2, 34+1, 38+4	10·3
16	3770	150	Lp	=26	10·0*b*
23	3777	100	,,	20 (2) v (2) 22	9·9
23	3777	64	Sa	22−1, 26+1	10·1
28	3782	,,	,,	11−10, 22+1, 26+1, 34+3	10·0
1924 Jan 3	3788	,,	,,	16−2, 22+1, =26	9·8
5	3790	100	Lp	=26	10·0*b*
10	3795	64	Sa	=26, =29	10·1
11	3796	94	Bl	16 (3) v (1) 26, =26	9·9*b*
16	3801	34	Sa	22+1, 26+2, 29+1	9·9*b*
17	3802	157	Wf	16−5, =26	10·0
20	3805	64	Sa	22−1, 26−1, =29, 34+5	10·1
27	3812	134	,,	22−5, 29−2, =35, =38	10·6
27 Feb 1	3812	150	Lp	26 (2) v (1) 53	10·7*b*
1	3817	120	Bn	38 (4) v (1) 48	11·2
1924 Feb 15	3831	94	Bl	48 (3) v (1) 59	11
19	3835	150	Wf	48−4, =59	11
28	3844	94	Bl	59 (5) v (1) 67, =67	12
Mar 1	3846	134	Sa	<59	<11
9	3854	94	Bl	77−3, =82	13
9	3854	120	Bn	<67	<12
29	3874	94	Bl	<82	<13
Apr 1	3877	150	Lp	<78	<13
14	3890	134	Sa	<78	<13
17	3893	94	Bl	Estimated	<13
24	3900	231	Wf	94−3	15
May 4	3910	M	Ph	<91	<14
5	3911	231	Wf	<94	<14
12	3918	,,	,,	<93	<14
13	3919	94	Bl	<80	<13
23	3929	231	Wf	<94	<14
25	3931	M	Ph	<91	<14
27	3933	94	Bl	<83	<13
June 1	3938	231	Wf	<94	<14
5	3942	94	Bl	<83	<13
13	3950	206	Sa	<78	<13
20	3957	M	Ph	<91	<14
23	3960	,,	,,	<91	<14
23	3960	231	Wf	<94	<14
26	3963	,,	,,	<94	<14
29	3966	94	Bl	<84	<14
30	3967	M	Ph	<91	<14
30	3967	231	Wf	94−5	14
July 3	3970	,,	,,	94−3	14
4	3971	M	Ph	<91	<14
6	3973	94	Bl	<84	<14
7	3974	231	Wf	94−4	14
10	3977	,,	,,	94−4	14
10	3977	M	Ph	<91	<14
18	3985	231	Wf	=94	14
22	3989	,,	,,	91−3, =94	14
24	3991	,,	,,	91−3, 94+2	14
27	3994	157	,,	91−2, 94+2	14
28	3995	244	Ha	88 (4) v (1) 91	14
29	3996	M	Ph	91−1	14
Aug 1	3999	157	Wf	87−3, 91+2	14
4	4002	,,	,,	87−2, 91+2	14
7	4005	M	Ph	82 (1) v (1) 91, 82−3	14
20	4018	157	Wf	78−1, 82+2	14
26	4024	,,	,,	78−3, =82	14
27	4025	134	Sa	<78	<14
31	4029	157	Wf	=78	14
31	4029	M	Ph	78−2	14
Sept 3	4032	134	Sa	<78	<14

July 4, Only doubtfully glimpsed.
Aug. 4, Sept. 5, Doubtfully glimpsed.
Aug. 15, Invisible.
Sept. 8, Invisible. Not even glimpsed.
Oct. 23, Not visible.
Nov. 3, 14, Not seen.
Jan. 5, Difficult.
Jan. 27, Lp, Difficult.

Mar. 1, Apr. 14, June 13, Aug. 27, Sept. 3, 1 visible.
Mar. 9, Bn, Not seen.
April 1, Not seen.
May 4, 5, 12, 23, 25, June 1, 20, 23 (both ob 26, Invisible.
June 30, July 4, Ph, Invisible.
July 3, Very difficult, but quite certain.
July 7, Extremely difficult.
July 10, Ph, Possibly glimpsed.

(7220) S CYGNI—*continued.*

1924					
Sept					
7	4036	157	Wf	67−4, 78+2	12·8
8	4037	134	Sa	=78	13·0
17	4046	206	,,	74−2, 78+1	12·9
22	4051	94	Bl	48−4, =59	11·7
26	4055	157	Wf	59−4, 67+1	12·2
27	4056	134	Sa	59−10, 74+2, 78+4	12·6
29	4058	T	Bk	59−4, =65	12·0*b*
29	4058	94	Bl	48 (2) v (3) 59	11·5
Oct					
1	4060	134	Sa	59−7, 74+2, 78+7	12·4
3	4062	100	Lp	<67	<12·4*b*
5	4064	157	Wf	63−2, 78+6	12·3
6	4065	T	Bk	59−1, 63+1	11·8*b*
6	4065	134	Sa	=74	12·7
8	4067	,,	,,	67−1, 74+2	12·5
11	4070	94	Bl	=50, 59+2	11·6
14	4073	134	Sa	59−1	11·8
15	4074	T	Bk	48−4, =59	11·7
16	4075	150	Wf	42−3, 48+1	11·3
22	4081	OG	Ph	=53, 48+1	11·2
23	4082	134	Sa	48−1	11·5
23	4082	100	Lp	48 (2) v (3) 59, 48 (2) v (1) 67	11·8
24	4083	94	Bl	38 (1) v (4) 48	10·9
27	4086	44	Li	26 (5) v (5) 34	10·2
Nov					
1	4091	90	Sa	=44	11·1
1924					
Nov					
3	4093	64	Sa	29−2, 35+2, =38, 48+4	10·6
3	4093	94	Li	25 (3) v (7) 40	10·4
5	4095	,,	Bl	=26	10·0
12	4102	90	Sa	26−3, 29−2, =34	10·4
12	4102	44	Li	29 (5) v (5) 34	10·3
14	4104	T	Bk	=26	10·0
15	4105	94	Bl	=26	10·0
27	4117	T	Bk	=22, =26	10·0
30	4120	44	Li	26 (3) v (7) 40	10·2
Dec					
4	4124	T	Bk	35−1, 38+1	10·7
4	4124	,,	Ba	=40, 43+5	10·6
6	4126	193	Li	=48	11·4*b*
9	4129	,,	,,	40 (8) v (2) 48	11·2
12	4132	T	Bk	42−1, =48	11·2
15	4135	193	Li	40 (7) v (3) 48	11·2
20	4140	121	Ha	=49	11·3
20	4140	T	Bk	43−5, 59+1·5	11·6
23	4143	94	Bl	48 (2) v (1) 57	11·5
24	4144	T	Bk	=59	11·7
28	4148	121	Ha	49 (4) v (1) 63	11·8
30	4150	150	Lp	<59	<11·7*b*

Oct. 3, Not seen.

Dec. 4, Bk, 4[c].
Dec. 12, 7[c].
Dec. 30, Not seen.

(7428) V CYGNI. (V. 5.)

H.D. 203847.

Date.	Julian Date.	Inst.	Observer.	Comparisons.	Deduced Mag.
1918					
May					
7	1721	45	Bh	=5	8·5
10	1724	,,	Br	5−2, 9+1	8·7
16	1730	,,	Bh	2−3, 5+5, 9+8	8·0
18	1732	90	,,	2−4	8·1
26	1740	45	,,	2−6	8·3
29	1743	,,	,,	2−3	8·0*c*
31	1745	,,	,,	5+5	8·0
June					
4	1749	90	,,	2−3, 5+5	8·0
4	1749	45	Br	9−2, 11+2	9·0
13	1758	,,	Bh	5+2	8·3*b*
21	1766	90	,,	=5	8·5
29	1774	,,	,,	=9, 11+5	8·8
July					
3	1778	,,	,,	9−5, =11	9·3
8	1783	,,	,,	9−5, 11−2	9·4
1918					
July					
18	1793	45	Bh	9−2, 11+2	9·0
25	1800	90	,,	9−4, 23+6	9·3*b*
28	1803	150	,,	11−6, =23, 26+4	10·0
Aug					
9	1815	90	,,	26−6, 35+3	11·3
16	1822	,,	,,	26−6, 29−3, 35+2	11·4*b*
18	1824	,,	,,	35−3	12·1*b*
20	1826	160	Br	29−3, 35+2	11·6
21	1827	90	Bh	29 (1) v (1) 35	11.5*b*
31	1837	,,	,,	35−2	12·0
Sept					
8	1845	,,	,,	=55	12·5
10	1847	,,	,,	55−1	12·6
28	1865	,,	,,	55−2, 59+2	12·8
Oct					
10	1877	150	,,	59+1, 63+3	12·9

May 18, Intense orange.
May 29, Intense orange red.

July 18, Orange red.
Aug. 18, Difficult.

(7428) V CYGNI—*continued.*

1918					
Oct					
13	1880	90	Bh	55−5, 59+1, 63+5, 70+5	12·9*b*
23	1890	,,	,,	<55	<12·5
25	1892	,,	,,	63−1	13·2
31	1898	,,	,,	63−1	13·2
Nov					
2	1900	150	,,	59−2, 63+1	13·1
5	1903	90	,,	55−4, 63+4	12·8*b*
8	1906	120	,,	55−4, 63+4	12·8
21	1919	150	,,	55−4, 63+4	12·8*b*
22	1920	90	,,	55+1	12·4*b*
30	1928	,,	,,	<55	<12·5
Dec					
5	1933	150	,,	55 (1) v (2) 59	12·7
10	1938	90	,,	55−3, 59+3	12·8
13	1941	,,	,,	35−6, 55+1	12·4
18	1946	,,	,,	35−6, 55+2	12·3*b*
20	1948	,,	,,	=55	12·5*b*
23	1951	,,	,,	=55, 63+10	12·3
29	1957	150	,,	=55	12·5
1919					
Jan					
2	1961	90	,,	55+1	12·4
6	1965	,,	,,	55+1, 59+4	12·6*b*
10	1969	,,	,,	55+1	12·4*b*
18	1977	,,	,,	55+1	12·4
22	1981	,,	,,	55+2	12·3
26	1985	,,	,,	35−5, 55+3	12·2
Feb					
7	1997	,,	,,	35−3, 55+5	12·0*b*
9	1999	150	,,	35−4, 55+4	12·1*b*
12	2002	90	,,	35+1	11·7
23	2013	,,	,,	27−6, 35+3	11·5
28	2018	,,	,,	27−5, 29−1, 35+5	11·3
Mar					
9	2027	45	,,	11−5, =23	9·9*b*
15	2033	90	,,	5−10, 27+4	10·0
21	2039	,,	,,	9−7, 23+5	9·5*b*
31	2049	,,	,,	9−5, 26+10	9·4*b*
Apr					
1	2050	,,	,,	9−5, 23+5, 26+10	9·4
7	2056	,,	,,	23+5, 26+10	9·5
12	2061	,,	,,	9−3, =11	9·2*b*
18	2067	,,	,,	9−5, 23+5	9·4*b*
20	2069	,,	,,	9−6, 23+5	9·4
26	2075	,,	,,	9−5, 23+5	9·4
May					
2	2081	,,	,,	5−7, 9−5, 23+5	9·3
4	2083	,,	,,	9−5, 23+5	9·4
8	2087	30	D	=23	10·0
9	2088	90	Bh	5−2, 9+1	8·7*b*
11	2090	45	,,	9+1, 23+8	8·9
13	2092	90	,,	5−3, 9+1	8·7
19	2098	,,	,,	5−2, 9+2	8·6
19	2098	60	D	11−6, 23+1	9·9
21	2100	90	Bh	5−1, 9+3	8·5
22	2101	30	D	11−6, 23+1	9·9
26	2105	90	Bh	11−4, 23+2	9·7*c*
30	2109	45	,,	5−1, 9+2	8·6
30	2109	30	D	11−5, 23+2	9·8*b*
30	2109	50	Bn	11 (2) v (1) 23	9·7

Oct. 31, Not steady.
Nov. 8, 15-in. mirror.
Dec. 20, Bright orange.
Dec. 29, Orange.
May 26, Very doubtful.

1919					
June					
2	2112	90	Bh	5−5, 9−2	9·0
6	2116	,,	,,	9−5, 23+5	9·4
9	2119	,,	,,	9−7, 23+4	9·5
9	2119	30	D	11−6, 23+1	9·9
9	2119	50	Bn	9 (4) v (1) 11	9·2
13	2123	90	Bh	5−7, 23+8	9·2
14	2124	60	D	23+1	9·9*b*
16	2126	50	Bn	9−4, 11+1	9·2
17	2127	60	D	11−5, 23+2	9·8*b*
21	2131	50	Bn	11 (2) v (1) 23	9·7
21	2131	90	Bh	5−5, 9−2	9·0
28	2138	,,	,,	5−10, 23+3	9·6
July					
5	2145	,,	,,	23+1, 27+10	9·9
7	2147	60	D	23−1, 26+4	10·1*b*
20	2160	90	Bh	5−12, 23+3	9·7
25	2165	,,	,,	23−3, 26+2	10·3
30	2170	50	Bn	26+1	10·4*b*
Aug					
8	2179	60	D	26−3	10·8*b*
8	2179	90	Bh	26−3, =27, 35+8	10·9
12	2183	,,	,,	23−10, 26−5, 27−1	11·0
16	2187	,,	,,	27−2, 35+6	11·1
19	2190	,,	,,	27−3, 35+5	11·2
19	2190	60	D	29−1, 35+3	11·4*b*
24	2195	90	Bh	26−8, 35+4	11·3
27	2198	60	D	29−3, 35+2	11·6
30	2201	90	Bh	26−10, 27−6, 35+2	11·5
Sept					
7	2209	,,	,,	=35	11·8
7	2209	160	Br	=29	11·3
15	2217	90	Bh	35−3	12·1
19	2221	150	,,	35−2	12·0
20	2222	60	D	<27	<10·9
23	2225	150	Bh	35−4	12·2
27	2229	90	,,	35−4	12·2
28	2230	160	Br	59+1, 63+2	12·9
28	2230	120	Bn	55 (1) v (1) 59	12·8*b*
30	2232	90	Bh	35−5	12·3
Oct					
4	2236	,,	,,	35−5	12·3
12	2244	,,	,,	=55, 59+5	12·6
14	2246	120	Br	=55	12·5
15	2247	150	Bn	59+1·5, 63+2	12·9*b*
16	2248	,,	Bh	55−2, 59+3	12·8
19	2251	,,	,,	55 (1) v (2) 59	12·7
21	2253	90	,,	55−4, 59+1	13·0
28	2260	150	,,	59+1	13·0
31	2263	,,	Bn	63+1	13·0
Nov					
2	2265	,,	Bh	59−1	13·2
10	2273	90	,,	=70	13·5
21	2284	150	Bn	<59	<13·1
28	2291	90	Bh	=70	13·5*b*
Dec					
11	2304	150	,,	=70	13·5
19	2312	,,	Bn	<59	<13·1
21	2314	90	Bh	70−1	13·6
27	2320	150	,,	70−1	13·6

June 6, Orange.
June 13, Unsteady.
June 21, Bh, Unsteady.
June 28, Orange.
July 5, Orange. Unsteady.
Nov. 21, Dec. 19, Not seen.

(7428) V CYGNI—*continued.*

1920					
Jan					
1	2325	240	Br	63−1, 70+2	13·2
5	2329	90	Bh	<70	<13·5
8	2332	157	Th	63+2	12·9*b*
20	2344	167	Bn	<59	<13·1
22	2346	90	Bh	70−1	13·6
24	2348	157	Th	70+2	13·3
31	2355	,,	,,	63+2	12·9*b*
Feb					
8	2363	,,	,,	63−2	13·3*b*
11	2366	90	Bh	63−2, 70+2	13·3*b*
15	2370	,,	,,	63−1	13·2
23	2378	,,	,,	=63, =70	13·3*b*
29	2384	,,	,,	63+1, 70+4	13·0
Mar					
12	2396	,,	,,	63+3	12·8
18	2402	,,	,,	59−1, 63+1	13·1
18	2402	60	D	<27	<10·9
22	2406	90	Bh	35−10, 55−5, =59	13·0*b*
25	2409	,,	,,	59+1, 63+5	12·8
31	2415	,,	,,	=55	12.5*b*
Apr					
9	2424	,,	,,	35−3, 55+5	12·0
12	2427	,,	,,	=35	11·8
17	2432	,,	,,	29−2, 35+4	11·4
21	2436	,,	,,	=29	11·3
27	2442	,,	,,	29+2	11·1*b*
May					
4	2449	,,	,,	27−3, =29, 35+6	11·2*b*
7	2452	,,	,,	27−3, 29+2, 35+6	11·1*b*
9	2454	,,	,,	11−7, 27+5	10·2*b*
12	2457	,,	,,	23−3, 26+2	10·3*b*
14	2459	,,	,,	23−2, 27+3	10·4*b*
14	2459	45	Br	11−6, 23+2	9·8*b*
14	2459	50	Bn	26 (1) v (1) 27	10·7*b*
17	2462	90	Bh	23+2	9·8*b*
21	2466	45	,,	5−5, 9−3	9·0*b*
21	2466	50	Bn	11 (2) v (1) 23	9·7
23	2468	,,	,,	11 (4) v (1) 23	9·8
23	2468	45	Th	=17	9·7
23	2468	90	Bh	5−5	9·0*b*
29	2474	,,	,,	5−5	9·0*b*
29	2474	50	Bn	9 (4) v (1) 11	9·2
June					
2	2478	90	Bh	5+1	8·4*b*
4	2480	,,	,,	5−5	9·0
6	2482	50	Bn	9 (5) v (1) 11	9·2
8	2484	,,	,,	9−4, 11+1	9·2
8	2484	90	Bh	5−3	8·8*b*
15	2491	,,	,,	5−2	8·7
15	2491	62	Th	4−2	8·6*b*
18	2494	50	Bn	9 (3) v (1) 11	9·1

Jan. 8, 31, Very red.
Jan. 20, Not certainly seen.
Feb. 8, Difficult.
Feb. 23, May 4, 7, Unsteady.
April 12, 21, Orange.
May 14, Br, Very red.
May 17, 21, Bh, Red.
May 23, Bn, Orange. Th, With 12¼-in. spec. at Headley. Bh, Red.
May 29, Bn, Reddish orange.
June 2, Crimson.
June 4, 6, Orange.
June 18, Bn, Orange.

1920					
June					
18	2494	90	Bh	=5	8·5*b*
23	2499	45	,,	5−5	9·0*b*
29	2505	90	,,	5−3, =9	8·8
July					
3	2509	65	Mn	4 (3) v (1) 16, 5 (2) v (1) 23	9·4
15	2521	50	Bn	11 (1) v (2) 23	9·5
15	2521	90	Bh	5−2, 11+5	8·7*b*
19	2525	,,	,,	=9, 11+3	8·9*b*
23	2529	75	Gi	4−2·5, 16+3·5	9·0
24	2530	50	Bn	11 (1) v (1) 23	9·6
24	2530	65	Mn	4 (3) v (2) 23	9·3*b*
29	2535	75	Gi	5−4, 16+3	9·1*b*
30	2536	90	Bh	5−6	9·1
Aug					
1	2538	65	Mn	5−1	8·6*b*
6	2543	90	Bh	5−5, 11+2	9·0*b*
8	2545	75	Gi	4−8, 17+4	9·3*b*
13	2550	60	Mn	4 (7) v (3) 16, 17+3	9·3*b*
14	2551	90	Bh	=11	9·3*b*
21	2558	75	Gi	4−6, 16+4	9·1*b*
22	2559	60	Mn	4 (2) v (1) 16, 8−2	9·1*b*
Sept					
1	2569	90	Bh	11−4, 23+2	9·7
2	2570	75	Gi	4−6, =13, 16+3	9·2
4	2572	60	Mn	4 (3) v (1) 16, 13+1	9·3*b*
4	2572	90	Bh	=26	10·5
6	2574	,,	,,	26−2, 27+2	10·7
8	2576	60	D	<23	<10·0
11	2579	,,	Mn	4 (7) v (3) 16, 13+1	9·2*b*
11	2579	75	Bn	26 (1) v (1) 27	10·7
16	2584	90	Bh	=26	10·5
22	2590	,,	,,	11−3, 23+3	9·6
27	2595	117	Gi	=17	9·7
29	2597	150	Bh	23+2	9·8
Oct					
6	2604	90	,,	23+3, 27+10	9·8
9	2607	,,	,,	23+1, 26+5	9·9
11	2609	32	Mn	11 (5) v (4) 23	9·7
12	2610	90	Bh	=23, 27+10	9·9
15	2613	117	Gi	17−1, 23+3	9·7
18	2616	90	Bh	23 (2) v (1) 29, 23 (1) v (1) 27	10·6
20	2618	32	Mn	=16	9·6*b*
22	2620	45	Bh	27−2, 29+2	11·1*b*
25	2623	90	,,	27 (1) v (2) 35	11·2
28	2626	32	Mn	11 (7) v (3) 23, 17−0·5	9·8
29	2627	90	Bh	=27, =29	11·1*b*
30	2628	160	Br	29−1·5, 35+3	11·4
Nov					
1	2630	60	D	<26	<10·5*b*
2	2631	90	Bh	27−2, 29+2	11·1
10	2639	117	Gi	24−1·5, 25+2·5	10·7*b*
10	2639	90	Bh	27−3, 29+1	11·2
13	2642	,,	,,	=27, =29	11·1
17	2646	60	Mn	=29	11·3*c*
22	2651	90	Bh	27−3, =29, 35+5	11·2
25	2654	117	Gi	23−1, 26+3	10·1*b*
30	2659	90	Bh	29−3, 35+2	11·6

June 23, Oct. 20, Nov. 13, Red.
July 24, Mn, Crimson.
Aug. 13, Crimson.
Sept. 16, Unsteady.
Oct. 6, Unsteady. Golden.
Nov. 10, Bh, Red.
Nov. 17, Not constant.

(7428) V CYGNI—*continued.*

1920 Dec					
3	2662	60	Mn	35 (2) v (1) 55	12·3*b*
6	2665	90	Bh	29−8, 35−3	12·1
10	2669	,,	,,	35−5	12·3
12	2671	32	Mn	35−1	11·9
21	2680	60	,,	35−4	12·2*c*
26	2685	150	Bh	55−6, 59+1, 63+1, 70+3	13·1
31	2690	,,	,,	=59, =63	13·1
1921 Jan					
2	2692	90	,,	=59, =63	13·1*b*
5	2695	80	Ca	<35	<11·8
13	2703	90	Bh	=59, =63	13·1*b*
14	2704	75	Bn	<49	<12·2
15	2705	32	Mn	29 (2) v (1) 35	11·6*c*
17	2707	117	Gi	26−3, =33	11·1*c*
27	2717	90	Bh	=63, =70	13·3
30	2720	150	,,	<59	<13·1
31	2721	90	Mn	35 (1) v (1) 55	12·1*c*
Feb					
1	2722	150	Bh	=63, =70	13·3*b*
2	2723	120	Bn	63+2	12·9
3	2724	90	Mn	35 (3) v (1) 55	12·3*b*
17	2738	80	Ca	<35	<11·8
17	2738	150	Bh	<63	<13·1
19	2740	117	Gi	23−1, 26+1	10·2*b*
22	2743	90	Mn	26 (1) v (1) 27	10·7*b*
Mar					
2	2751	,,	Bh	35−5	12·3
6	2755	,,	,,	35−3	12·1
9	2758	,,	Mn	26 (2) v (1) 35	11·3*c*
11	2760	,,	Bh	35+3	11·5
16	2765	,,	,,	35+1	11·7
18	2767	32	Mn	17 (2) v (1) 23	9·9*b*
21	2770	45	Bh	=35	11·8*b*
24	2773	90	,,	27−6, 35+2	11·5
29	2778	,,	,,	=26, 27+3	10·5
31	2780	50	Bn	29 (2) v (1) 35	11·6
Apr					
1	2781	90	Bh	=27, =29	11·1
3	2783	117	Gi	=23, 26+4	10·0
7	2787	90	Mn	17 (1) v (2) 23	9·8*b*
8	2788	,,	Bh	26−3, 27−1	10·9
9	2789	,,	,,	26−2, 27+2	10·7
12	2792	,,	,,	26−2, 27+2	10·7
15	2795	60	D	<26	<10·5
18	2798	80	Ca	<35	<11·8
19	2799	90	Bh	11−5, 23+1	9·8
25	2805	,,	,,	5−9, 11−2	9·4
26	2806	,,	,,	5−5, =11	9·1
29	2809	,,	,,	5−8, 11−2	9·4
30	2810	120	Br	35+3	11·5
May					
5	2815	47	Gi	17+2·5	9·5
7	2817	90	Bh	=11	9·3
1921 May					
9	2819	50	Bn	23 (2) v (1) 26	10·3
9	2819	90	Bh	=11	9·3
15	2825	,,	,,	11+2	9·1
19	2829	50	Bn	11 (4) v (1) 23	9·8
21	2831	45	Bh	9−2	9·0
23	2833	50	Bn	11 (3) v (1) 23	9·8
24	2834	90	Bh	=9, =11	9·0
29	2839	60	D	23−6, 26+1	10·5
June					
1	2842	80	Ca	=26	10·5
2	2843	90	Bh	9−1, 11+2	9·0
3	2844	75	Gi	4−2·5, 16+6	8·8
5	2846	30	D	23−2, 26+3	10·2
5	2846	90	Bh	=9	8·8
6	2847	50	Bn	9 (4) v (1) 11	9·2
10	2851	90	Bh	9+3	8·5
11	2852	50	Bn	4 (2) v (1) 5	8·5
15	2856	90	Bh	5+1, 9+5	8·3
16	2857	30	D	11−4, 23+4	9·6
16	2857	47	Gi	=4	8·4
21	2862	90	Bh	=5	8·5
23	2864	50	Bn	3 (2) v (1) 4	8·3
24	2865	30	D	=11	9·3
24	2865	90	Bh	=5	8·5
27	2868	,,	,,	=5	8·5
27	2868	32	Ca	11−0·6, 23+6·4	9·3
28	2869	50	Bn	3 (2) v (1) 4	8·3
28	2869	47	Gi	=3	8·1
29	2870	30	D	k−2, 11+1	9·2
July					
2	2873	90	Bh	5+1	8·4
4	2875	,,	,,	5+3	8·2
4	2875	30	D	11+1	9·2
5	2876	32	Ca	11−0·4, 23+6·6	9·3
5	2876	50	Bn	3 (2) v (1) 4	8·3
7	2878	90	Bh	5+4	8·1
8	2879	30	Bn	3 (2) v (1) 4	8·3
10	2881	,,	D	5−5, 11+2	9·0
11	2882	90	Bh	2−4, 5+4	8·1
13	2884	30	D	5−6, 11+2	9·1
13	2884	47	Gi	2−6, 3+3	8·0
21	2892	30	D	5−4·5, 11+3·5	8·9
25	2896	,,	,,	5−3·5, 11+4·5	8·8
25	2896	50	Bn	3 (1) v (1) 4	8·3
26	2897	45	Bh	1−6, 2+3, 5+10	7·4
28	2899	30	D	5−5, 11+3	9·0
29	2900	45	Bh	2+2, 5+10	7·5
30	2901	30	D	5−1, 11+6	8·6
30	2901	47	Gi	2−3, 3+5	7·8
Aug					
3	2905	30	D	5−3, 11+5	8·8
4	2906	32	Ca	1−1, 5+1	8·4
6	2908	90	Bh	5+10	7·5
6	2908	30	D	5−3, 11+6	8·7
8	2910	,,	Bn	2+4	7·3
9	2911	,,	D	5−2, 11+5	8·7

Dec. 21, Just glimpsed.
Jan. 5, Invisible.
Jan. 14, 30, Not seen.
Jan. 15, Varying markedly. At moments <35.
Jan. 31, Varying. Bh remarks for his 1921 obs. :—"Colour always deep red, unless otherwise described."
Feb. 3, Poor visibility, *i.e.* faint and difficult, but fairly constant.
Feb. 17, Ca, Invisible. Bh, Not seen.
May 7, Scarlet.
May 9, Bn, Orange.
June 5, D, Very red.
June 6, 11, 23, Orange.
June 28, Bn, Reddish orange.
July 5, Bn, Orange red.
July 7, Scarlet.
July 25, Bn, Very red.
July 30, D, Orange.
Aug. 6, Bh, Orange.
Aug. 8, Reddish orange.

(7428) V CYGNI—*continued.*

1921 Aug					
11	2913	47	Gi	2−2, 3+6	7·7*b*
15	2917	45	Bh	1−6, 2+3	7·3
19	2921	,,	,,	1−7, 2+3	7·4*b*
23	2925	30	D	5−5, 11+3	9·0*b*
25	2927	45	Bh	1−7, 2+4	7·3
26	2928	30	D	5−4, 11+5	8·8
28	2930	,,	,,	5−3, 11+5	8·8
30	2932	,,	,,	5−4, 11+6	8·8
30	2932	45	Bh	1−6, 2+3	7·3
31	2933	30	D	5−3·5, 11+4·5	8·8
Sept					
2	2935	,,	,,	=5	8·5
2	2935	32	Ca	f−0·5, 5+1·5	8·3
3	2936	30	D	5+1	8·4
3	2936	,,	Bn	3+3	7·8
3	2936	47	Gi	2−2, 3+4	7·8
4	2937	45	Bh	1−5, 2+5	7·2
5	2938	30	D	=5	8·5
6	2939	,,	,,	e−5, 5+1	8·4*b*
8	2941	,,	,,	=5	8·5
8	2941	,,	Bn	2 (3) v (1) 3	8·0
9	2942	32	Ca	f−0·7, 5+1·3	8·4
10	2943	45	Bh	1−6, 2+3	7·3
14	2947	30	D	5−2, 11+6	8·7
16	2949	45	Bh	2+2	7·5
21	2954	90	,,	2+1	7·6
21	2954	30	D	5+2	8·3*b*
23	2956	,,	,,	5−2, 11+5	8·7
24	2957	45	Bh	2+2	7·5
24	2957	30	Bn	2 (3) v (1) 3	8·0
25	2958	,,	D	5+1	8·4
27	2960	,,	,,	5−2, 11+6	8·7
30	2963	45	Bh	2−3	8·0
30	2963	47	Gi	2−4, 3+4	7·9*b*
Oct					
1	2964	30	D	5−3, 11+5	8·8
4	2967	25	Bn	2 (3) v (1) 3	8·0
5	2968	90	Bh	=2	7·7
5	2968	30	D	5−1	8·6
7	2970	32	Ca	=5	8·5
8	2971	25	Bn	2 (3) v (1) 3	8·0
8	2971	45	Bh	=2	7·7
15	2978	90	,,	2−2	7·9
16	2979	25	Bn	2 (3) v (1) 3	8·0
17	2980	45	Bh	2−4, 5+5	8·0*b*
20	2983	47	Gi	2−3·5, 3+5	7·8*b*
23	2986	45	Bh	2−5	8.2
23	2986	25	Bn	2 (4) v (1) 3	8·0
27	2990	90	Bh	5+3	8·2
29	2992	32	Ca	5−1, 9+2	8·6
31	2994	90	Bh	2−6, 5+3	8·2
Nov					
6	3000	50	Bn	3+2	7·9
7	3001	45	Br	=2	7·7
8	3002	30	Bn	3+2	7·9
10	3004	50	,,	3+3	7·8
12	3006	90	Bh	2−5, 5+5	8·1
17	3011	47	Gi	2−5, 3+2·5	8·0
20	3014	90	Bh	=5	8·5
20	3014	32	Ca	=11	9·3
23	3017	90	Bh	=9	8·8
23	3017	50	Bn	4 (2) v (1) 5	8·5
26	3020	90	Bh	5−1, 9+3	8·5

Sept. 6, Difficult.
Nov. 6, Orange red.
Nov. 7, Very red.

1921 Nov					
27	3021	50	Bn	9 (2) v (1) 11	9·1
29	3023	90	Bh	5+2	8·3
Dec					
3	3027	,,	,,	5+1	8·4
4	3028	,,	,,	5+2	8·3
10	3034	47	Gi	3−1·5, 4+2	8·2
13	3037	45	Bh	5−3, =9	8·8
19	3043	90	,,	=9	8·8
20	3044	50	Bn	11 (1) v (3) 23	9·4
25	3049	45	Br	=4	8·4
25	3049	90	Bh	11−4, 23+2	9·7*b*
26	3050	,,	,,	5−10, 9−5	9·4
28	3052	75	Bn	11 (1) v (2) 23	9·5
29	3053	90	Bh	23+4	9·6
1922 Jan					
3	3058	75	Bn	23+1·5	9·8
3	3058	90	Bh	23+6	9·4
4	3059	45	Br	4−1, =5	8·5
5	3060	75	Gi	6 (2) v (1·5) 7	8·7
8	3063	90	Bh	5−5	9·0
18	3073	,,	,,	9−4	9·2
28	3083	,,	,,	=11	9·3
Feb					
17	3103	,,	,,	23+3	9·7
Mar					
3	3117	75	Gi	=17	9·7
4	3118	90	Bh	23+1	9·9
19	3133	,,	,,	23−1, 27+7	10·1
28	3142	,,	,,	26+1	10·4
Apr					
4	3149	,,	,,	26−1, 27+3, 35+10	10·6
18	3163	,,	,,	35+1	11·7
23	3168	,,	,,	=35	11·8
29	3174	,,	,,	35−1	11·9
May					
1	3176	80	Ca	29−4, 35+1	11·7
2	3177	90	Bh	35−2	12·0
5	3180	160	Br	27−3, 29+1	11·2
8	3183	90	Bh	35−3	12·1
15	3190	120	Bn	29 (3) v (2) 35	11·6
17	3192	90	Bh	35−4	12·2
21	3196	62	D	<26	<10·5
21	3196	117	Gi	=24	10·6
27	3202	160	Br	27−3, 29+1	11·2
27	3202	90	Bh	27−6, 35+2	11·5
June					
4	3210	,,	,,	35+4	11·4
4	3210	120	Bn	29 (1) v (1) 35	11·5
5	3211	117	Gi	17 (1·5) v (2·5) 24	10·0
15	3221	90	Bh	26+1	10·4
17	3223	62	Wf	=23, 26+3	10·1*b*
26	3232	90	Bh	11−7, 26+5	10·0
28	3234	117	Gi	11 (3·5) v (1·5) 17	9·6
July					
1	3237	80	Ca	29−1, 35+4	11·4
2	3238	150	Wf	=23, 26+3	10·1

Dec. 3, 13, Yellow. Not sharp.
Dec. 4, 19, Not sharp.
Dec. 26, Scarlet.
Jan. 5, Mar. 3, June 28, 9^{c}.
May 21, Gi, 8^{c}.
June 17, Blood red.
July 2, Very red.

(7428) V CYGNI—*continued.*

1922					
July					
10	3246	117	Gi	17+1	9·6
10	3246	90	Bh	5−10, 11−3	9·5
20	3256	,,	,,	=11	9·3
20	3256	50	Bn	9 (4) v (1) 11	9·2
23	3259	150	Wf	23+3, 26+6	9·8*b*
30	3266	45	Br	4−2, 5−1	8·6
30	3266	150	Wf	23+3, 26+7	9·7
30	3266	50	Bn	11+1	9·2*b*
31	3267	90	Bh	5−5, 11+3	9·0
Aug					
4	3271	,,	,,	5−3, 11+5	8·8
11	3278	,,	,,	=5	8·5
12	3279	,,	,,	5+2, 9+5	8·3
16	3283	62	Wf	4−1, 9+2	8·5*b*
17	3284	90	Bh	2−7, 9+3	8·4
20	3287	,,	,,	2−5, 9+5	8·2
21	3288	75	Gi	3 (1) v (2·5) 5	8·2
21	3288	62	Wf	4−7, =11	9·2*b*
23	3290	,,	,,	=4, 5−2	8·6
24	3291	30	Bn	2 (3) v (1) 3	8·0
25	3292	45	Br	=2	7·7*b*
25	3292	90	Bh	2−7, 9+3	8·4
31	3298	,,	,,	2−5, 9+5	8·2
Sept					
5	3303	,,	,,	2−4, 9+6	8·1
10	3308	,,	,,	2−5, 9+5	8·2
10	3308	62	Wf	=4	8·4*b*
15	3313	90	Bh	5+8, 9+10	7·7
16	3314	62	Wf	=5	8·5*b*
18	3316	45	Bh	=2	7·7
21	3319	90	,,	=2	7·7
23	3321	62	Wf	=4	8·4*b*
24	3322	30	Bn	2 (3) v (1) 3	8·0
26	3324	90	Bh	=2	7·7
Oct					
2	3330	45	,,	=2	7·7
6	3334	90	,,	5+7, 9+10	7·8
8	3336	62	Wf	2−3, 4+5	7·9*b*
12	3340	90	Bh	=2, 5+10	7·6
13	3341	50	Bn	2 (3) v (1) 3	8·0
15	3343	62	Wf	=4	8·4
16	3344	75	Gi	2 (2·5) v (3·5) 3	7·9
18	3346	90	Bh	5+10, 9+12	7·5
22	3350	30	Bn	2 (4) v (1) 3	8·0
22	3350	31	D	9−1, 11+2	9·0
25	3353	45	Bh	=2	7·7
Nov					
1	3360	90	,,	2+2	7·5
4	3363	25	Bn	2 (3) v (1) 3	8·0
9	3368	45	Bh	2+2, 5+10	7·5
15	3374	50	Bn	2 (4) v (1) 3	8·0
17	3376	90	Bh	2−4, 5+4	8·1
19	3378	45	Br	2−2·5, 4+5	7·9
22	3381	47	Gi	2 (3) v (3·5) 3	7·9

July 10, Gi, 8c.
July 20, 30, Bn, Reddish orange.
July 30, Wf, Red.
Aug. 16, Very red. Difficult.
Aug. 21, Gi, 9c.
Aug. 25, Br, About. Difficult to judge. Orange.
Sept. 10, Wf, Red. Difficult.
July 23, Sept. 16, 23, Oct. 15, Very red.
Oct. 8, Very red. Difficult.
Oct. 16, Nov. 22, 8c.

1922					
Nov					
24	3383	50	Bn	3+1, 4+3	8·
24	3383	45	Bh	5+4	8·
28	3387	,,	,,	5+5	8·
Dec					
1	3390	,,	,,	2−6, 5+2	8·
6	3395	90	,,	5−1	8·
11	3400	,,	,,	5−2	8·
17	3406	,,	,,	5−2	8·
18	3407	50	Bn	5 (3) v (1) 11	9·
25	3414	90	Bh	=5	8·
26	3415	30	Bn	9 (1) v (1) 11	9·
1923					
Jan					
4	3424	90	Bh	=5	8·
8	3428	30	Bn	11 (1) v (4) 23	9·
14	3434	,,	,,	11 (2) v (1) 23	9·
14	3434	34	Li	2 (8) v (2) 4	8·
16	3436	90	Bh	5−5	9·
20	3440	62	Wf	10−5, 23+4	9·
23	3443	75	Bn	11 (2) v (1) 23	9·
30	3450	90	Bh	5−10, 23+5	9·
Feb					
4	3455	,,	,,	23+4	9·
4	3455	50	Bn	11 (3) v (1) 23	9·
7	3458	62	Wf	10−7, 23+4	9·
11	3462	50	Bn	11 (4) v (1) 23	9·
17	3468	45	Bh	23+2	9·
27	3478	,,	,,	23−2, 26+3	10·
Mar					
13	3492	90	,,	23−6, 26−2	10·
25	3504	,,	,,	=27	10·
27	3506	75	Gi	16 (2) v (1·5) 17	9·
Apr					
6	3516	150	Wf	=35	11·
9	3519	90	Bh	=27	10·
13	3523	,,	,,	=26, =27	10·
14	3524	,,	,,	26−2, 27+3	10·
15	3525	62	Wf	29−3, 35+5	11·
23	3533	,,	,,	=29, 35+4	11·
24	3534	60	D	29−3, 35+2	11·
27	3537	90	Bh	26−5, 27−1	11·
May					
3	3543	,,	,,	35−1	11·
4	3544	117	Gi	23+1·5, 24−2	10·
7	3547	90	Bh	35−2	12·
13	3553	60	D	35−3	12·
17	3557	90	Bh	35−3	12·
21	3561	,,	,,	=35	11·
21	3561	150	Wf	29−2, 35+3	11·
21	3561	120	Bn	49 (2) v (1) 55	12·
25	3565	60	D	<35	<11·
June					
2	3573	90	Bh	35+3	11·
5	3576	150	Wf	=27, 29+3	10·
11	3582	60	D	<35	<11·
21	3592	90	Bh	35−1	11·
22	3593	117	Gi	17 (1·5) v (3) 23, 24+1	10·
July					
3	3604	150	Wf	27−2, 29+2, 35+5	11·
5	3606	90	Bh	23−8, 35+8	10·
6	3607	120	Bn	49 (1) v (2) 55	12·
13	3614	62	Wf	27−2, 29+2	11·
14	3615	90	Bh	27+1, 35+10	10·

Mar. 27, May 4, 8c.
June 5, Deep red. Very difficult.
June 22, 9c.

(7428) V CYGNI—*continued.*

1923 Aug					
1	3633	90	Bh	23−3, =26	10·4*b*
3	3635	,,	,,	=23	10·0
5	3637	OG	Ph	35 (1) v (1) 55	12·1*b*
5	3637	150	Wf	=27, 29+3	10·9
8	3640	50	Bn	23 (2) v (1) 26	10·3
10	3642	OG	Ph	27−2, =29, 35+4	11·2
11	3643	90	Bh	23−3, =26	10·4
13	3645	50	Bn	23−3, 26+2	10·3
13	3645	150	Wf	26 (7) v (1) 27	10·8*b*
15	3647	OG	Ph	=29, 35+2	11·4
18	3650	90	Bh	=26	10·5
28	3660	,,	,,	23−3, 26+2	10·3*b*
30	3662	50	Bn	11 (2) v (1) 23	9·7
Sept					
2	3665	120	D	27−2, 29+3	11·0*b*
3	3666	150	Wf	=26, 27+3	10·5
4	3667	90	Bh	=23	10·0
5	3668	50	Bn	11 (3) v (1) 23	9·8
7	3670	90	Bh	5−10, 23+5	9·5
8	3671	60	D	26−3, 27+2	10·7
8	3671	62	Wf	26−1, 27+3	10·6
10	3673	45	Br	23+5	9·5*b*
10	3673	90	Bh	5−8, 23+6	9·3
11	3674	60	D	26−3, 27+1	10·8
14	3677	150	Wf	23−4, =26	10·4*b*
15	3678	50	Bn	9 (4) v (1) 11	9·2
18	3681	60	D	23−4, 26+1	10·4
20	3683	90	Bh	5−5, 9+2	8·8
26	3689	,,	,,	=9	8·8
30	3693	60	D	11−5, 23+3	9·7
Oct					
1	3694	150	Wf	=23, 26+3	10·1
1	3694	90	Bh	=5	8·5
7	3700	45	,,	2−5, 5+5	8·1*b*
8	3701	157	Wf	11−3, 23+5	9·5
11	3704	90	Bh	2−6, 5+3	8·2
13	3706	30	D	=11	9·3
14	3707	50	Bn	4 (2) v (1) 5	8·5
16	3709	45	Bh	2−5, 5+5	8·1
21	3714	90	,,	=2, 5+8	7·7
26	3719	45	,,	=2	7·7
27	3720	62	Wf	=4	8·4*b*
28	3721	50	Bn	2−1, 3+4	7·7
Nov					
1	3725	45	Bh	=2	7·7
2	3726	30	D	5−1, 9+3	8·5
10	3734	25	Bn	1 (7) v (3) 2	7·4
10	3734	45	Bh	=2	7·7
13	3737	,,	,,	=2	7·7
13	3737	30	D	5−2, 9+1	8·7*b*
16	3740	45	Bh	=2	7·7
18	3742	50	Bn	2 (2) v (3) 3	7·8
19	3743	45	Bh	=2	7·7
23	3747	,,	,,	=2	7·7
30	3754	,,	,,	=2	7·7
30	3754	50	Bn	2−2, 3+3	7·8
Dec					
2	3756	90	Bh	=2	7·7
4	3758	45	Bh	=2	7·7
8	3762	,,	,,	2+2	7·5
9	3763	30	D	5−1, 9+2	8·6
11	3765	62	Wf	4−2, 9+1	8·6
12	3766	45	Bh	2−1	7·8
15	3769	50	Bn	=2	7·7
19	3773	45	Bh	2−3	8·0
20	3774	50	Bn	2−1, 3+4	7·7
21	3775	90	Bh	2−2	7·9
24	3778	45	,,	=2	7·7
28	3782	,,	,,	2−3	8·0
30	3784	30	D	5−2, 9+2	8·6
1924 Jan					
3	3788	45	Bh	2−2	7·9
6	3791	50	Bn	2 (3) v (2) 3	7·9
6	3791	30	D	5−2, 9+2	8·6
7	3792	45	Bh	2−3	8·0
11	3796	90	,,	2−4, 5+3	8·1
15	3800	40	D	5−1, 9+3	8·5
17	3802	62	Wf	4+3, 5+2	8·2
20	3805	45	Bh	2 (2) v (1) 5	8·2*b*
23	3808	,,	,,	2 (1) v (1) 5	8·1
23	3808	40	D	5−3, 9+1	8·7
25	3810	50	Bn	2−5, 3+1	8·1
26	3811	90	Bh	2−5	8·2
27	3812	22	Bl	2 (3) v (3) 5	8·1
27	3812	30	D	5−5, =9	8·9
Feb					
1	3817	40	,,	5−5, 9−1	8·9
1	3817	50	Bn	3 (1) v (1) 4	8·3
8	3824	62	Wf	4+1, 5+2	8·3
14	3830	40	D	=9	8·8
15	3831	22	Bl	2+0·5	7·6*b*
16	3832	50	Bn	3+1, 4+3	8·1
18	3834	45	Bh	2 (1) v (1) 5	8·1*b*
19	3835	62	Wf	4+2, 5+2	8·3
22	3838	45	Bh	5 (1) v (1) 9	8·6
24	3840	50	Bn	=9	8·8
27	3843	45	Bh	5 (1) v (1) 9	8·6
28	3844	22	Bl	2 (1) v (5) 4	7·8
Mar					
2	3847	45	Bh	5−2, 9+1	8·7
4	3849	50	Bn	9 (1) v (1) 11	9·0
6	3851	22	Bl	4 (1) v (5) 9, =4	8·4*b*
9	3854	50	Bn	9 (1) v (2) 11	8·9
10	3855	30	D	11−5, 23+3	9·7
10	3855	90	Bh	5−2, 9+1, 11+5	8·7
14	3859	45	,,	9+1	8·7
26	3871	90	,,	9−1	8·9*b*
29	3874	22	Bl	11 (5) v (3) 23	9·7
30	3875	60	D	23+2	9·8*b*
Apr					
1	3877	50	Bn	9 (4) v (1) 11	9·2
2	3878	90	Bh	9−2	9·0
4	3880	50	Bn	11+2	9·1
4	3880	60	D	23+2	9·8
6	3882	90	Bh	9 (1) v (1) 11	9·0
7	3883	50	Bn	9 (5) v (1) 11	9·2
14	3890	45	Bh	9 (1) v (1) 11	9·0
17	3893	94	Bl	11 (1) v (5) 23, =11	9·4*b*
20	3896	50	Bn	9−5, 11+1	9·2
20	3896	45	Bh	=11	9·3
24	3900	62	Wf	=23, 26+3	10·1*b*

Aug. 3, Nov. 16, Scarlet.
Aug. 5, Wf, Very red.
Aug 10, Intensely red.
Aug. 15, Intensely red. Difficult.
Aug. 18, Nov. 19, Dec. 2, Orange red.
Sept. 2, Not sure.
Sept. 8, 14, Wf, Blood red.
Oct. 1, 11, Bh, Orange.
Dec. 8, Orange.
Mar. 10, Bh, Orange red.

(7428) V CYGNI—*continued.*

1924 Apr 25	3901	90	Bh	9−4, 11+1	9·2
May 3	3909	,,	,,	11−5, 23+1	9·8
5	3911	,,	,,	23+1	9·9
5	3911	50	Bn	11 (6) v (1) 23	9·9
5	3911	60	D	27−3, 29+2	11·1
8	3914	62	Wf	27 (1) v (1) 29	11·1
9	3915	60	D	27−4, 29+1	11·2
12	3918	62	Wf	=26, 27+4	10·5
16	3922	90	Bh	=23	10·0b
10	3925	70	Bn	23 (3) v (1) 26	10·1
21	3927	60	D	27−3, 29+1	11·2
22	3928	90	Bh	23+1	10·1
24	3930	60	D	27−3, 29+1	11·2
26	3932	,,	,,	27−3, 29+2	11·1
27	3933	90	Bh	23−3	10·5
28	3934	120	Bn	26 (3) v (2) 27	10·7
28	3934	62	Wf	26−4, 27+1	10·8
30	3936	60	D	27−4, 29+1	11·2
June 2	3939	62	Wf	27−4, =29	11·3
5	3942	60	D	27−4, 29+3	11·0
12	3949	,,	,,	27−3, 29+2	11·1
13	3950	90	Bh	26 (1) v (1) 27	10·7
17	3954	60	D	=29	11·3
22	3959	,,	,,	29−4, 33+3	11·4
24	3961	150	Wf	29−3, 33+2	11·6
29	3966	60	D	29−3, 33+2	11·6
28	3965	62	Wf	. =33	11·8
28	3965	90	Bh	26 (1) v (2) 33	10·0
29	3966	90	D	29−3, 33+2	11·6b
30	3967	90	Bh	26−5, 33+7	11·0
July 3	3970	150	Wf	29−3, 33+2	11·6
5	3972	60	D	=33	11·8
6	3973	M	Ph	27 (1) v (1) 33, =29	11·4
7	3974	,,	,,	29 (1) v (1) 33	11·5b
7	3974	150	Wf	33+1, 49+5	11·7
9	3976	120	D	33−2	12·0
10	3977	M	Ph	27−2, =29	11·2
13	3980	120	Bn	27 (3) v (1) 29	11·2
14	3981	,,	D	=49	12·2b
21	3988	,,	Bn	29 (3) v (1) 33	11·0
22	3989	150	Wf	=29	11·3
23	3990	90	Bh	27 (1) v (1) 33	11·1
27	3994	62	Wf	33−1, 49+3	11·9
28	3995	121	Ha	29 (3) v (2) 33	11·0
29	3996	90	Bh	27 (2) v (1) 33	11·5
29	3996	M	Ph	=27	10·9
30	3997	120	Bn	29 (3) v (1) 33	11·0
Aug 2	4000	90	Bh	27 (1) v (1) 33	11·1
4	4002	62	Wf	29−3, 33+2	11·6
7	4005	120	Bn	27 (3) v (1) 29	11·2
8	4006	90	Bh	27 (1) v (2) 33	11·2
10	4008	120	D	33−1, 49+3	11·9b

May 5, Bh. Red orange.
May 21, June 22, 0c.
May 22, 27, Scarlet.
July 7, Ph, Difficult. Very red. Very sharp disc.
July 10, First comparison half weight. Very red. Very sharp disc.
July 14, Absent.
July 29, Ph, Intensely red. Seems more sharply defined than any other star.

1924 Aug 19	4017	90	Bh	27−1	11·0
19	4017	120	Bn	29 (1) v (1) 33	11·4
22	4020	62	Wf	29−4, 33+5	11·3
26	4024	90	Bh	=27	10·9
27	4025	62	Wf	=29, 33+4	11·1
27	4025	60	D	=33	11·8
31	4029	90	Bh	=27	10·9
Sept 2	4031	,,	,,	=27	10·9
4	4033	62	Wf	27−2, 33+5	11·2
7	4036	,,	,,	26−4, 27+4	10·8
12	4041	120	D	27−3, 29+3	11·0
17	4046	90	Bh	=26, =27	10·7b
19	4048	60	D	27−2, 29+3	11·0
22	4051	22	Bl	23 (4) v (1) 26, =26	10·4
23	4052	60	D	26−3, 27+2	10·7
26	4055	150	Wf	26−4, =27	10·9
27	4056	90	Bh	23−1	10·1
29	4058	,,	,,	=23	10·0
29	4058	22	Bl	=26	10·5
Oct 5	4064	90	Bh	23+1	9·7
5	4064	62	Wf	=26	10·5
12	4071	50	Bn	11 (6) v (1) 23	9·9b
13	4072	90	Bh	23+1	9·9
16	4075	150	Wf	23−2, 26+2	10·2
23	4082	M	Ph	23+2	9·8
23	4082	50	Bn	9 (4) v (1) 11	9·2
23	4082	90	Bh	=23	10·0
24	4083	,,	,,	23+1	9·7
24	4083	90	D	23−1, 26+1	10·1
27	4086	34	Li	=4	8·4
27	4086	90	Bh	23+1	9·9
31	4090	,,	,,	=23	10·0
Nov 1	4091	,,	,,	11 (1) v (1) 23	9·6
3	4093	34	Li	2 (7) v (3) 3	8·6
3	4093	50	Bn	9−4, 11+1	9·2
4	4094	40	D	23+1	9·7
7	4097	34	Li	2 (6) v (4) 3	7·9
9	4099	60	D	11−4, 23+3	9·7
10	4100	90	Bh	11−2	9·5
12	4102	34	Li	2 (3) v (3) 3	7·8
15	4105	45	Bh	9−5, =11	9·3
15	4105	22	Bl	9 (1·5) v (1·5) 11	9·1
17	4107	86	Ha	4 (1) v (4) 10	8·5
17	4107	34	Li	2 (8) v (2) 3	8·6
10	4100	45	Bh	9 (1) v (1) 11	9·0
27	4117	,,	,,	=9	8·8
27	4117	50	Bn	9−3, 11+2	9·1
30	4120	60	D	11−4, 23+4	9·6
30	4120	34	Li	2 (1) v (2) 3	7·8
Dec 2	4122	45	Bh	5 (1) v (1) 9	8·6
3	4123	50	Bn	9 (2) v (2) 11	9·0
5	4125	68	Ha	3 (1) v (1) 4	8·3
6	4126	34	Li	1 (8) v (2) 2	7·5
6	4126	37	Wh	2 (2) v (2) 4	8·0
6	4126	45	Bh	5+1	8·4
9	4129	68	Ha	3 (1) v (2) 4	8·3
9	4129	34	Li	1 (6) v (4) 2	7·1

Oct. 23, Ph. Very red. Image seems sharper and more piercing than that of any other star.
Oct. 27, Li, 8c. Difficult.
Nov. 3, 30, Li, 9c.

(7428) V CYGNI—*continued.*

1924 Dec					
12	4132	45	Bh	5+1	8·4
14	4134	,,	,,	5+3	8·2
14	4134	68	Ha	3 (1) v (1) 4	8·3
14	4134	25	Bn	2 (3) v (1) 3	8·0
15	4135	34	Li	1 (7) v (3) 2	7·4
16	4136	68	Ha	2 (2) v (1) 3	8·0
20	4140	37	Wb	1 (2) v (3) 2	7·1
22	4142	90	Bh	2 (1) v (3) 5	7·9
23	4143	40	D	5+4	8·1*b*

1924 Dec					
23	4143	22	Bl	1 (7) v (2) 2	7·4
24	4144	45	Bh	=2	7·7
26	4146	,,	,,	2+1	7·6
26	4146	68	Ha	2 (2) v (3) 5	8·0
26	4146	25	Bn	2 (1) v (2) 3	7·8
29	4149	40	D	2−3, f+2	8·1
29	4149	37	Wb	2 (2) v (3) 3	7·8
30	4150	25	Bn	2 (2) v (1) 3	8·0
31	4151	45	Bh	2+2	7·5

Dec. 23, D, Difficult.

(7754) W CYGNI. (V. 6.)

H.D. 213244.

Comparison Stars used :—

A = B.D. + 44° 3889,	6^m·12,	**H.A.,**	**45,** 277.
B = ,, + 43° 4002,	6·70,	,,	**54,** 246.
C = ,, + 45° 3584,	6·56,	,,	**45,** 276.
D = ,, + 45° 3558, Fl. 71 Cygni,	5·38,	,,	**45,** 274.
E = Fl. 75 Cygni,	5·35,	,,	**50,** 183.
F = B.D. + 46° 3305,	5·54	,,	**50,** 182.
H = ,, + 45° 3577,	7·60 (adopted mag.)		
K = ,, + 44° 3843,	6·82,	**H.A.,**	**54,** 244.
L = ,, + 43° 3941,	7·52,	,,	**54,** 244.
X = ,, + 45° 3637,	6·47,	,,	**50,** 183.

A (B.D. +44° 3889) has been found by Okuneff, from visual estimates, to be a variable star of the β Lyrae type (A.N. 5294, 1924), and has received the designation CP Cygni (A.N. 5331, 1924). But the small amount of the variation (6^m·2 − 6^m·4) and of the residuals in the measures of this star made at Harvard and Potsdam, together with the fact that the alleged period approximates to half a day (0^d·4984), appear to render a confirmation of the variability by photometry or photography highly desirable.

C being suspected as a variable by several observers, no use is made of this star in reducing the magnitudes. It has, however, been considered advisable to record comparisons with C as made.

Date.	Julian Date.	Inst.	Observer.	Comparisons.	Deduced Mag.
1920 Jan					
1	2325	45	Bh	A+2	5·9
2	2326	F	AB	A−3, C+3·5	6·4*b*
5	2329	30	Bn	A (1) v (5) B	6·2
5	2329	45	Bh	A+1	6·0
7	2331	,,	,,	A+1	6·0
8	2332	30	Bn	A (1) v (1) B	6·4
8	2332	B	Ma	A (3) v (1) B, C+7	6·6
9	2333	45	Bh	A+1	6·0
9	2333	22	Nl	=A	6·1
9	2333	B	D	A−4, B+2	6·5*b*
13	2337	F	AB	A−2, C+3·5	6·3*c*
13	2337	45	Bh	=A	6·1

Date.	Julian Date.	Inst.	Observer.	Comparisons.	Deduced Mag.
1920 Jan					
14	2338	B	D	A−4, B+3	6·5
15	2339	45	Bh	A−1	6·2
16	2340	30	Bn	A (1) v (2) B	6·3
18	2342	F	AB	A−2, C+3	6·3
18	2342	45	Bh	=A	6·1*b*
19	2343	30	Bn	A (2) v (1) B	6·3
19	2343	B	Ma	B+1, C+7	6·6
21	2345	F	,,	B−1	6·8
21	2345	45	Bh	A+1	6·0

Jan. 21, Ma, With B, 6·6.

(7754) W CYGNI—*continued.*

1920					
Jan					
22	2346	B	D	A−5, B+1	6·6
22	2346	22	Ni	A+1	6·0
23	2347	45	Bh	A+2	5·9
24	2348	30	Bn	A (5) v (2) B	6·5
24	2348	F	Ma	A (1) v (1) B	6·4
25	2349	45	Bh	A+2	5·9
29	2353	F	AB	F−4·5, A+1, C+4	6·0
31	2355	30	Bn	A (3) v (1) B	6·6
Feb					
1	2356	F	AB	A−2, C+4	6·3*b*
3	2358	B	D	B+3	6·4*b*
4	2359	45	Bh	A+2	5·9
5	2360	,,	,,	=F, A+5	5·6
5	2360	22	Ni	F (3) v (3) A	5·8
6	2361	F	Bn	F (1) v (2) A	5·7
6	2361	,,	Ma	A+1	6·0*b*
6	2361	B	D	A+1	6·0*b*
7	2362	,,	,,	A−4, B+3	6·5
8	2363	,,	,,	A−5, B+1	6·6
8	2363	30	Bn	F (1) v (1) A	5·8
8	2363	F	Ma	=A	6·1
10	2365	45	Bh	A+4	5·7
11	2366	,,	,,	A+3	5·8*b*
11	2366	F	Bn	F (1) v (1) A	5·8*b*
11	2366	22	Ni	F (3) v (2) A	5·9*b*
12	2367	B	D	A−4, B+2	6·5
15	2370	45	Bh	A+4	5·7
16	2371	B	D	A−3, B+2	6·5*b*
17	2372	,,	,,	A−4, B+2·5	6·5
17	2372	,,	Ma	A (2) v (1) B, C+5	6·5
17	2372	25	Bn	F (1) v (2) A	5·7
18	2373	45	Bh	A+5	5·6
18	2373	22	Ni	F (3) v (3) A	5·8
21	2376	B	Ma	B+1, C+5	6·6
22	2377	,,	D	A−4, B+2	6·5
24	2379	45	Bh	A+4	5·7
24	2379	22	Ni	F (2·5) v (2·5) A	5·8
26	2381	B	Ma	A (3) v (1) B, C+6	6·6
26	2381	,,	Bn	F (1) v (2) A	5·7*b*
29	2384	45	Bh	A+2	5·9
Mar					
3	2387	,,	,,	A+2	5·9
6	2390	50	Bn	A+1·5	6·0
7	2391	45	Bh	A+2	5·9
12	2396	,,	,,	A+2	5·9
15	2399	22	Ni	F (3) v (2) A	5·9
18	2402	45	Bh	A−2, X+2	6·3
18	2402	B	D	A−5, B+1	6·6
19	2403	50	Bn	A (1) v (1) B	6·4
22	2406	22	Ni	F (3) v (2) A	5·9
23	2407	30	Bn	A (1) v (2) B	6·3
23	2407	B	D	B−1, K+2	6·7
23	2407	45	Bh	A−2	6·3
25	2409	,,	,,	A−3, X+2	6·3
25	2409	50	Bn	A (1) v (2) B	6·3
Apr					
11	2426	45	Bh	A−2, X+4	6·2
13	2428	30	Bn	A (2) v (1) B	6·5
13	2428	B	D	B−3, K+2	6·8

Jan. 24, Ma, With B, 6·6.
Feb. 3, Difficult.
Feb. 6, Ma, With B, 6·6. D, Difficult.
Feb. 8, Bn, With B, 5·8. Ma, About, With B, 6.5 Much >C.
Mar. 6, With B, 6·0.
April 13, Bn, With B, 6·5.

1920					
Apr					
15	2430	22	Ni	=A	6
16	2431	,,	,,	A (3) v (3) B	6
16	2431	B	D	B−3, K+2	6
17	2432	45	Bh	A−1	6
20	2435	22	Ni	=A	6
21	2436	45	Bh	A−2, X+2	6
21	2436	30	Bn	A (3) v (2) B	6
21	2436	B	D	B−3, K+1	6
23	2438	,,	,,	B−3, K+2	6
27	2442	45	Bh	A−3, =X	6
29	2444	30	Bn	A (1) v (3) B	6
May					
3	2448	,,	,,	A (1) v (3) B	6
4	2449	45	Bh	A−2, X+2	6
4	2449	22	Ni	A (4) v (2·5) B	6
7	2452	30	Bn	A (1) v (5) B	6
7	2452	45	Bh	A−2, X+1	6
7	2452	B	D	B−3, K+2	6
9	2454	,,	,,	=K	6
9	2454	45	Bh	A−1, X+3	6
9	2454	B	AB	A−5, C+2	6
9	2454	30	Bn	A+1	6
10	2455	B	D	B−3, K+2	6
12	2457	22	Ni	A (4) v (2) B	6
13	2458	30	Bn	A (1) v (4) B	6
13	2458	B	D	B−3, K+2	6
14	2459	,,	,,	B−3, K+1	6
17	2462	45	Bh	A+2	5
19	2464	,,	,,	F−2, A+4	5
19	2464	30	Bn	A (1) v (4) B	6
21	2466	,,	,,	A (1) v (4) B	6
21	2466	45	Bh	D−5, F−3, A+3	5
21	2466	B	D	B−3, K+1	6
22	2467	22	Ni	A (3) v (4) B	6
23	2468	B	Mn	A−4	6
23	2468	45	Bh	A+3	5
23	2468	30	Bn	A (1) v (4) B	6
26	2471	12	Mn	A−5	6
26	2471	B	AB	A−3, C+2	6
28	2473	22	Ni	F (4) v (1·5) A	6
29	2474	30	Bn	A+1	6
30	2475	F	AB	A−3·5, C+1	6
June					
1	2477	12	Mn	A−2	6
1	2477	30	Bn	A−1	6
2	2478	45	Bh	A+5	5
4	2480	,,	,,	D−3, A+5	5
5	2481	F	Mn	=A	6
6	2482	,,	AB	A−3, C+2	6
6	2482	30	Bn	A (1) v (4) B	6
8	2484	,,	,,	A (1) v (4) B	6
8	2484	22	Ni	F (1) v (4) A	5
8	2484	B	D	A−3·5, B+2·5	6
9	2485	,,	,,	A−3, B+3	6
11	2487	,,	,,	A−3, B+4	6
11	2487	,,	Mn	F (2) v (1) A	5
12	2488	,,	D	A−4, B+2	6
13	2489	,,	Ma	A (4) v (1) B, C+7	6
13	2489	45	Bh	=F, A+5	5
13	2489	B	Mn	F (5) v (4) A	5
14	2490	F	,,	D (1) v (1) F	5

April 21, D, Doubtful.
April 23, June 8, D, Difficult.
May 29, With B, 6·0.
June 1, Mn, Difficult.
June 14, With B, 5·4.

(7754) . W CYGNI—*continued.*

1920 June					
15	2491	B	D	A−4, B+3	6·5
15	2491	45	Bh	D−2, =F, A+5	5·6
17	2493	B	Mn	F−2, A+4	5·7
18	2494	,,	,,	F (2) v (1) A	5·9*b*
18	2494	,,	Bn	F (2) v (1) A	5·9
18	2494	45	Bh	D−3, =F, A+6	5·6*b*
19	2495	F	AB	A−3, C+3	6·4
19	2495	B	D	A−3, B+4	6·4*b*
19	2495	,,	Mn	F (2) v (3) A	5·8
20	2496	F	AB	A−1, C+3·5	6·2
22	2498	B	D	A−1, B+4	6·3
22	2498	F	AB	A−1·5, C+3·5	6·3
23	2499	45	Bh	A+4	5·7*b*
25	2501	B	Mn	F (2) v (1) A	5·9
29	2505	,,	,,	A+1	6·0*b*
29	2505	45	Bh	D−3, =F	5·6
30	2506	B	D	E−6, A+2	5·9
July					
3	2509	,,	Mn	F−1, A+4	5·7
6	2512	45	Bh	D−2, =F	5·6*b*
8	2514	B	D	E−6, A+2	5·9
8	2514	,,	Ma	D (4) v (1) F, A+4	5·6
9	2515	22	Ni	D (2) v (2) F	5·5
10	2516	F	AB	F−1·5, A+2	5·8
11	2517	,,	,,	A+2·5	5·9
11	2517	B	D	E−5, A+3	5·8
12	2518	,,	,,	E−5, A+2	5·9*b*
13	2519	,,	AB	F−2, A+2	5·8
14	2520	22	Ni	D (4) v (3) F	5·5*b*
14	2520	F	Bn	D (2) v (1) F	5·5
14	2520	B	Mn	D (1) v (1) F	5·5*b*
14	2520	,,	D	E−4, A+3	5·8
15	2521	45	Bh	D−2, =F	5·6
15	2521	B	Ma	A (1) v (9) B	6·2
16	2522	F	AB	F−3, A+1·5	5·9
16	2522	B	D	E−4, A+3	5·8
17	2523	,,	,,	E−5, A+2	5·9
17	2523	B	Mn	=F	5·5*b*
17	2523	F	Bn	F−1	5·6*b*
18	2524	B	Ma	D (1) v (1) F	5·5
19	2525	,,	D	E−6, A+2	5·9
19	2525	45	Bh	D−3, =F	5·6
19	2525	22	Ni	D (2) v (4) F	5·4
20	2526	F	AB	F−4, A+2	5·9
20	2526	B	D	A+1	6·0
22	2528	,,	,,	E−6, A+2	5·9
24	2530	F	Bn	D (2) v (1) F	5·5
24	2530	B	Ma	D (1) v (1) F	5·5
24	2530	,,	Mn	D (3) v (1) F	5·5
26	2532	45	Bh	D−2, F+1	5·5
27	2533	22	Ni	D (2) v (4) F	5·4
27	2533	B	D	E−5, A+2	5·9
27	2533	,,	Ma	D (1) v (1) F	5·5
28	2534	,,	,,	D (1) v (3) F	5·4
28	2534	F	Bn	D (3) v (1) F	5·5
29	2535	,,	AB	F−3, A+2	5·9
30	2536	45	Bh	D−2, =F	5·6
Aug					
1	2538	B	D	E−5, A+3	5·8*b*
1	2538	,,	Mn	F+0·5	5·5
2	2539	F	AB	A−1, C+5	6·2
3	2540	B	D	E−6, A+2	5·9

July 14, 28, Bn, With B, 5·5.
July 17, Bn, With B, 5·6.
July 18, Red. Much >C.
July 24, Bn, With B, 5·5. Ma, Orange tint.

1920 Aug					
3	2540	22	Ni	D (4) v (2) F	5·5
4	2541	F	AB	F−5, A+0·5	6·1
5	2542	B	Ma	D (4) v (1) F, A+3	5·6
6	2543	,,	Bn	F (2) v (1) A	5·9
6	2543	F	AB	F−5, A+1·5	6·0
6	2543	45	Bh	D−2, =F	5·6
7	2544	B	D	E−7, A+2	6·0
7	2544	,,	Ma	A (1) v (1) B	6·4
7	2544	F	AB	F−6, A+0·5	6·1
7	2544	B	Bn	F (5) v (2) A	6·0
9	2546	,,	,,	F (2) v (1) A	5·9
10	2547	,,	Ma	=F	5·5*b*
10	2547	,,	D	E−6, A+2	5·9
12	2549	F	AB	A−0·5, C+5·5	6·2
13	2550	B	Mn	F (4) v (1) A	6·0
13	2550	45	Bh	D−1, F+1	5·5
14	2551	,,	,,	=D, F+2, A+6	5·4
14	2551	30	Bn	A+1·5	6·0
15	2552	B	Ma	D (9) v (1) F, A+2	5·7
16	2553	,,	D	E−6, A+2	5·9
17	2554	,,	Ma	A (4) v (1) B	6·6*b*
19	2556	,,	,,	A+1·5	6·0
19	2556	30	Bn	A (1) v (3) B	6·3
20	2557	B	Ma	B+1	6·6
20	2557	,,	Mn	F (3) v (1) A	6·0
20	2557	45	Bh	A+3	5·8
21	2558	F	AB	A−3, C+3	6·4
22	2559	B	Ma	A−1	6·2
22	2559	30	Bn	A (4) v (7) B	6·3
24	2561	B	D	=A	6·1
25	2562	,,	,,	F (4) v (1) A, A+2	6·0
26	2563	30	Bn	A (1) v (3) B	6·3
26	2563	F	AB	A−1, C+4	6·2
26	2563	B	Mn	F (9) v (1) A	6·1
29	2567	30	Bn	A (1) v (2) B	6·3
30	2567	F	AB	A−3, C+3	6·4
Sept					
3	2571	B	D	A−2, B+4	6·3*b*
4	2572	45	Bh	A+1	6·0*b*
4	2572	B	Mn	A+0·5	6·1
5	2573	F	AB	A−3·5, C+2	6·5
5	2573	30	Bn	A (1) v (1) B	6·4
6	2574	45	Bh	A+2	5·9
6	2574	B	D	A−3, B+4	6·4*b*
6	2574	,,	Ma	<B, C+3	<6·7
6	2574	22	Ni	F (3) v (2) A	5·9
7	2575	30	Bn	A (2) v (1) B	6·5
8	2576	F	AB	A−3, C+2	6·4
8	2576	B	D	A−3, B+3	6·4
10	2578	22	Ni	F (2) v (3) A	5·8
10	2578	B	Mn	A (1) v (3) B	6·3*b*
10	2578	,,	Ma	=B	6·7
10	2578	30	Bn	A (2) v (1) B	6·5
10	2578	B	D	A−4, B+2	6·5
11	2579	48	Wi	A+1	6·0*b*
12	2580	,,	,,	A−1	6·2*b*
12	2580	30	Bn	A (5) v (2) B	6·5
12	2580	B	D	A−5, B+1	6·6
13	2581	45	Bh	A+2	5·9
13	2581	B	Ma	B−1, C+8	6·8
14	2582	F	AB	A−3, C+3	6·4
16	2584	45	Bh	A+2	5·9
16	2584	B	Mn	F (4) v (5) A	5·8

Aug. 14, Bn, With B, 6·0.
Aug. 19, Ma, Reddish orange.
Aug. 22, Ma, Very difficult.

(7754) W CYGNI—*continued.*

1920					
Sept					
16	2584	48	Wi	A+2	5·9*b*
17	2585	B	D	A−4, B+1	6·6*b*
17	2585	F	AB	A−3, C+3	6·4
18	2586	30	Bn	A (3) v (2) B	6·5
18	2586	B	Mn	F (1) v (1) A	5·8
18	2586	22	Ni	F (4) v (2·5) A	5·9
18	2586	48	Wi	=A	6·1*b*
19	2587	,,	,,	A−2	6·3*b*
19	2587	B	D	A−4, B+2	6·5
21	2589	,,	,,	A−3, B+2	6·3*b*
21	2589	45	Bh	=A	6·1*b*
22	2590	,,	,,	A+1	6·0
22	2590	B	D	A−2, B+4	6·3*b*
26	2594	45	Bh	A+2	5·9*b*
26	2594	30	Bn	A (1) v (1) B	6·4
29	2597	,,	,,	A (1) v (1) B	6·4
29	2597	B	Mn	=A	6·1*b*
Oct					
1	2599	22	Ni	F (4) v (2) A	5·9
1	2599	45	Bh	A−1	6·2
2	2600	48	Wi	A−1	6·2*b*
3	2601	B	D	B+0·5	6·7*b*
4	2602	,,	,,	A−4, B+1	6·6
5	2603	,,	,,	A−4, B+2	6·5
6	2604	30	Bn	A (1) v (1) B	6·4
6	2604	45	Bh	A−1	6·2
6	2604	B	Mn	A (1) v (2) B	6·3
8	2606	22	Ni	F (3·5) v (1·5) A	5·9
8	2606	B	D	A−3, B+2	6·5
9	2607	30	Bn	A (2) v (3) B	6·4
9	2607	B	Ma	B+1	6·6
10	2608	,,	D	A−5, B+1	6·6
11	2609	,,	,,	A−5, B+1, K+4	6·5
11	2609	,,	Ma	B+1	6·6
11	2609	30	Bn	A (1) v (2) B	6·3
12	2610	45	Bh	A−2	6·3
12	2610	B	D	A−5, B+1	6·6
12	2610	,,	Mn	A (1) v (4) B	6·2*b*
14	2612	48	Wi	C+1	...
14	2612	22	Ni	F (4) v (1·5) A	6·0
18	2616	30	Bn	A+1	6·0
18	2616	45	Bh	=A	6·1
18	2616	B	Ma	B+1·5	6·6
18	2616	,,	D	A−5, B+1	6·6
20	2618	,,	,,	A−5, B+2	6·6
20	2618	22	Ni	A (1) v (4) B	6·2
20	2618	B	Mn	A+1	6·0
22	2620	45	Bh	A−1	6·2
22	2620	F	AB	A−4, C+3	6·5
22	2620	30	Bn	A+1	6·0
23	2621	B	Ma	B+1	6·6*b*
24	2622	,,	D	A−3, B+3	6·4*b*
24	2622	22	Ni	F (4) v (1·5) A	6·0
25	2623	30	Bn	A+2	5·9
26	2624	45	Bh	=A	6·1*b*
26	2624	F	AB	A−4, C+3	6·5
27	2625	30	Bn	A+1	6·0
28	2626	F	AB	A−4·5, C+0·5	6·6
28	2626	B	Mn	A+1	6·0*b*
29	2627	45	Bh	A+1	6·0
30	2628	B	Ma	=B	6·7
Nov					
1	2630	22	Ni	F (5) v (1) A	6·0
1	2630	B	D	B−2, K+1	6·8*b*

Sept. 16, Wi. Very red.
Oct. 23, >C.

1920					
Nov					
1	2630	45	Bh	=A	6·
1	2630	30	Bn	A−1	6·
3	2632	45	Bh	A−1	6·
4	2633	F	AB	A−3, C+2·5	6·
4	2633	30	Bn	A−1	6·
5	2634	45	Bh	A−1	6·
6	2635	25	Bn	A (1) v (3) B	6·
8	2637	B	D	B−3, K+1, G+3	6·
8	2637	22	Ni	A (2) v (5) B	6·
10	2639	45	Bh	=A	6·
11	2640	B	Mn	A (1) v (2) B	6·
11	2640	25	Bn	A (1) v (2) B	6·
11	2640	B	Ma	B−1, C+4	6·
13	2642	45	Bh	=A	6·
15	2644	30	Bn	A (1) v (1) B	6·
16	2645	B	D	B−4, K−4, L+2	7·
16	2645	,,	Ma	B−2, C+1	6·
17	2646	B	Mn	A (1) v (1) B	6·
17	2646	F	AB	A−4, C+1	6·
18	2647	B	D	K−4, G+1	7·
18	2647	,,	Ma	=B, C+2·5	6·
19	2648	45	Bh	A−1	6·
20	2649	30	Bn	A (2) v (1) B	6·
21	2650	22	Ni	A (3) v (3) B	6·
22	2651	45	Bh	A−2	6·
22	2651	F	AB	C−2, H+4	7·
23	2652	25	Bn	A (3) v (1) B	6·
25	2654	F	AB	C−2, H+3·5	7·
26	2655	22	Ni	A (4) v (3) B	6·
28	2657	45	Bh	A−2	6·
30	2659	,,	,,	A−2	6·
Dec					
1	2660	30	Bn	B−1	6·
1	2660	F	AB	C−1, H+3	7·
1	2660	B	D	G−2, L+4	7·
1	2660	22	Ni	A (5) v (3) B	6·
3	2662	B	Mn	A (3) v (2) B	6·
3	2662	,,	Ma	B−2·5, C+1	7·
5	2664	45	Bh	A−2	6·
8	2667	,,	,,	A−2	6·
9	2668	30	Bn	B−1	6·
9	2668	B	Ma	B−3, C+2	7·
11	2670	45	Bh	A−3	6
12	2671	50	Bn	B−1	6·
12	2671	B	Mn	A (1) v (4) B	6·
16	2675	,,	Ma	B−2, C−3	6·
16	2675	45	Bh	A−3	6·
17	2676	F	AB	C−1, H+5	7·
20	2679	,,	,,	C−1, H+3	7·
21	2680	30	Bn	=B	6·
21	2680	45	Bh	A−5	6·
21	2680	B	Mn	B−2	6·
25	2684	45	Bh	A−3	6·
26	2685	30	Bn	=B	6·
27	2686	22	Ni	A (6) v (1) B	6·
28	2687	30	Bn	A (4) v (1) B	6·
30	2689	,,	,,	B+1	6·
31	2690	45	Bh	A−3	6·

Nov. 1, Bn, With B, 6·2.
Dec. 1, D, Not sure. Hurried.
Dec. 12, Mn, Not constant.
Dec. 21, Bn, C=A+1·5.
Dec. 28, C=A (2) C (1) B.

(7754) W CYGNI—*continued.*

1921					
Jan					
1	2691	25	AB	C−2, H+3	7·3
2	2692	45	Bh	A−5	6·6
2	2692	F	Ma	B−2·5, C−2	7·0
6	2696	25	AB	C−3, H+3	7·3
6	2696	45	Bh	A−5	6·6
7	2697	,,	,,	A−5, =X	6·5
7	2697	30	Bn	B+1	6·6
7	2697	B	Ma	B−3, C−3	7·0
9	2699	22	Ni	=B	6·7
9	2699	B	Ma	B−2, C−2	6·9
9	2699	45	Bh	A−4	6·5
10	2700	,,	,,	A−5	6·6
10	2700	30	Bn	A (3) v (1) B	6·6
12	2702	,,	,,	A−3·5, B+2	6·5
12	2702	B	Mn	=B	6·7*b*
13	2703	25	AB	C−2, H+3	7·3
13	2703	45	Bh	A−4, X+1	6·4
14	2704	B	D	G−2, L+3	7·1*b*
14	2704	,,	Ma	B−2, C−4	6·9
15	2705	20	Wi	A−7, B−1	6·8
15	2705	45	Bh	A−4	6·5
16	2706	B	D	G−1, L+4	7·0*b*
16	2706	22	Ni	A (2·5) v (3·5) B	6·4
18	2708	20	Wi	A−8, B−2	6·9
18	2708	B	Ma	B−1, C−2	6·8
18	2708	50	Bn	A (2) v (1) B	6·5
22	2712	25	,,	A (1) v (2) B	6·3
22	2712	45	Bh	A−1	6·2*b*
24	2714	,,	,,	A−1	6·2
29	2719	25	AB	A−3, C+1	6·4
30	2720	45	Bh	A+2	5·9
30	2720	B	D	B−3, K+1, G+4	6·7
31	2721	20	Wi	=A	6·1
31	2721	B	Mn	A (1) v (4) B	6·2*b*
31	2721	50	Bn	A (1) v (5) B	6·2
Feb					
1	2722	22	Ni	A (4) v (2·5) B	6·5
1	2722	45	Bh	D−3, A+3	5·8
2	2723	50	Bn	A−0·5	6·2
2	2723	48	Wi	A−7	6·8*b*
3	2724	,,	,,	A−5	6·6
3	2724	B	Mn	B−1	6·8*b*
3	2724	45	Bh	D−3, =F, A+3	5·7
3	2724	25	AB	A−4, C+1	6·5
9	2730	B	Ma	=B, C+2	6·7
12	2733	22	Ni	A (4) v (2·5) B	6·5
14	2735	45	Bh	A+5	5·6
15	2736	25	AB	A−2, C+3	6·3*b*
17	2738	45	Bh	A+5	5·6
17	2738	30	Bn	F (4) v (1) A	6·0
19	2740	22	Ni	F (3) v (2) A	5·9
20	2741	50	Bn	A+1·5	6·0
20	2741	B	Mn	F (2) v (1) A	5·9*b*
21	2742	45	Bh	=D, F+2, A+7	5·4
22	2743	48	Wi	=A	6·1

Jan, 2, Ma, With B, 7·2.
Jan. 7, Bn, C=B+2.
Jan. 12, Bn, A (3) C (2) B.
Jan. 13, Bn, A (3) C (1) B.
Jan. 14, Bn, A (2) C (1) B.
Jan. 16, D, Difficult.
Jan. 18, 22, Bn, A (1) C (1) B.
Jan. 31, Bn, C=A−2.
Feb. 2, Bn, C=A.
Feb. 17, Bn, A (1) C (2) B.
Feb. 20, Bn, A (2) C (3) B. Mn, Very difficult.

1921					
Mar					
2	2751	22	Ni	F (2) v (3) A	5·8
2	2751	B	D	A−3, B+2	6·5
2	2751	30	Bn	A+2	5·9
4	2753	25	AB	A−2, C+4	6·3
6	2755	45	Bh	D−2, =F, A+5	5·6
8	2757	B	Mn	F (1) v (5) A	5·6
11	2760	45	Bh	D−2, =F, A+4	5·6
12	2761	B	D	A−2, B+4	6·3*b*
12	2761	22	Ni	F (1·5) v (3) A	5·7*b*
14	2763	30	Bn	A+2	5·9
14	2763	B	Mn	D (4) v (1) F	5·5
18	2767	,,	,,	D (3) v (1) F	5·5
18	2767	22	Ni	D (3) v (2) F	5·5*b*
24	2773	,,	,,	D (5) v (1) F	5·5
24	2773	45	Bh	=D	5·4
27	2776	,,	,,	=D, A+5	5·5
31	2780	,,	,,	A+5	5·6
31	2780	B	Bn	F (2) v (1) A	5·9
Apr					
1	2781	45	Bh	=D, A+5	5·5
3	2783	30	Bn	A+2	5·9
3	2783	B	D	A−2, B+4	6·3*b*
4	2784	,,	Mn	F (1) v (1) A	5·8*b*
4	2784	45	Bh	A+5	5·6
6	2786	22	Ni	F (1·5) v (4) A	5·7*b*
7	2787	B	Mn	F (3) v (1) A	6·0*b*
7	2787	30	Bn	A+1	6·0
8	2788	45	Bh	A+4	5·7
9	2789	,,	,,	=D, A+5	5·5
11	2791	B	D	A−3, B+2	6·5
12	2792	45	Bh	D−2, =F, A+3	5·6
12	2792	30	Bn	A+1	6·0
14	2794	,,	,,	A+1	6·0
15	2795	45	Bh	D−2, =F, A+3	5·6
15	2795	B	D	A−4, B+2	6·5
15	2795	22	Ni	F (3) v (2) A	5·9
18	2798	B	D	A−4, B+2	6·5
19	2799	30	Bn	A (1) v (4) B	6·2
19	2799	45	Bh	A+3	5·8
23	2803	,,	,,	F−2, A+3	5·8
23	2803	30	Bn	A (1) v (4) B	6·2
25	2805	45	Bh	A+3	5·8
27	2807	22	Ni	A (1) v (4) B	6·2
27	2807	B	D	A−4, B+2	6·5
28	2808	,,	Mn	=A	6·1*b*
28	2808	50	Bn	A (1) v (3) B	6·3
28	2808	45	Bh	A+2	5·9
29	2809	,,	,,	A+3	5·8
29	2809	B	D	=B	6·7

Mar. 2, Bn, A (1) C (2) B.
Mar. 14, Bn, With B, 5·9. A (1) C (1) B.
Mar. 18, Ni, Very difficult.
Mar. 24, Bh, Scarlet.
April 4, Mn, C=A.
April 7, Mn, A (1) C (1) B. Bn, With B, 6·0. A (2) C (1) B.
April 12, Bn, With B, 6·0. C=A−1.
April 14, With B, 6·0. A (1) C (1) B.
April 18, B (1) C (3) K.
April 19, 23, Bn, A (1) C (1) B.
April 27, D, B (1) C (3) K.
April 28, Mn, C=A−2. Bn, A (2) C (1) B. D, B (2) C (3) K.
April 29, D, B (1) C (3) K.
April 30, D, B (2) C (3) K.

(7754) W CYGNI—*continued.*

1921					
May					
1	2811	30	Bn	A (1) v (2) B	6·3
3	2813	22	Ni	A (2) v (4) B	6·3
3	2813	B	D	B−2, K+3	6·7
5	2815	,,	,,	B−3, K+1	6·9
8	2818	48	Wi	A−4	6·5
8	2818	30	Bn	A (3) v (1) B	6·6
9	2819	45	Bh	A+2	5·9
9	2819	B	Mn	A (1) v (4) B	6·2*b*
11	2821	22	Ni	A (4) v (1·5) B	6·5
11	2821	B	D	B−3, K+2	6·8*b*
13	2823	,,	,,	B−2, K+2	6·8*b*
15	2825	30	Bn	A (3) v (1) B	6·6
15	2825	45	Bh	=A	6·1
16	2826	B	D	B−2	6·9*b*
19	2829	,,	Mn	A−1	6·2*b*
19	2829	22	Ni	=A	6·1
20	2830	30	Bn	B+1	6·6
23	2833	,,	,,	A (4) v (1) B	6·6
23	2833	22	Ni	A (3) v (3) B	6·4
24	2834	45	Bh	A−1	6·2
24	2834	B	Mn	A−1	6·2*b*
28	2838	,,	D	B−2, K+2	6·8
28	2838	48	Wi	A−5	6·6
29	2839	B	D	B−2, K+3	6·7
31	2841	,,	,,	B−3, K+2	6·8
31	2841	F	AB	A−4, C+2	6·5
31	2841	45	Bh	A−1	6·2
June					
1	2842	B	Mn	A (1) v (2) B	6·3
1	2842	22	Ni	A (1) v (4) B	6·2
2	2843	45	Bh	A−1	6·2
5	2846	,,	,,	A−1	6·2
6	2847	B	D	B−2, K+2	6·8
6	2847	30	Bn	A (2) v (1) B	6·5
6	2847	48	Wi	A−5	6·6
7	2848	,,	,,	A−2	6·3
7	2848	22	Ni	=A	6·1
7	2848	B	Mn	A+0·5	6·1
9	2850	48	Wi	A−4, B+2	6·5
10	2851	25	AB	A−3, C+2	6·4*b*
10	2851	45	Bh	A+1	6·0
11	2852	30	Bn	A (3) v (2) B	6·5
12	2853	F	AB	A−3, C+2	6·4
15	2856	B	Mn	F (5) v (1) A	6·0*b*

1921					
June					
15	2856	30	Bn	A (1) v (1) B	6·4
16	2857	B	D	A−5, B+1	6·0
17	2858	30	Bn	A (2) v (3) B	6·4
18	2859	45	Bh	A+1	6·0
21	2862	,,	,,	=A	6·0
23	2864	30	Bn	A (1) v (3) B	6·3
24	2865	F	AB	A−3, C+2	6·4
24	2865	B	D	A−4, B+2	6·8
25	2866	45	Bh	A+1	6·0
27	2868	,,	,,	=A	6·1
27	2868	B	D	A−3, B+2	6·8
28	2869	30	Bn	A−1	6·2
29	2870	B	D	A−1, B+4	6·3
July					
1	2872	F	AB	A−3, C+2	6·4
2	2873	22	Ni	A+1	6·0
4	2875	45	Bh	A−1	6·2
4	2875	B	D	A−4, B+2	6·8
5	2876	30	Bn	A+1	6·0
7	2878	22	Ni	=A	6·1
7	2878	45	Bh	=A	6·1
8	2879	B	D	A−4, B+1	6·0
8	2879	30	Bn	A+1	6·0
9	2880	B	Mn	F (2) v (1) A	5·9
9	2880	F	AB	A−4, =C	6·2
10	2881	B	D	=B	6·0
11	2882	45	Bh	=A	6·1
12	2883	30	Bn	A+1·5	6·0
12	2883	22	Ni	A (1) v (6) B	6·2
13	2884	B	D	A−5, B+1	6·0
15	2886	,,	,,	B−2, K+3	6·7
20	2891	30	Bn	A+1·5	6·0
21	2892	B	Mn	A−1	6·2
22	2893	25	AB	C−2, H+3	7·1
23	2894	,,	,,	C−1, H+4	7·2
25	2896	F	Wi	A−2	6·3
25	2896	30	Bn	A (1) v (1) B	6·4
26	2897	B	D	B−3, K+2	6·8
26	2897	45	Bh	=A	6·1
27	2898	F	AB	C−2, H+4	7·2
28	2899	B	D	B−2, K+3	6·7
29	2900	45	Bh	=A	6·1
29	2900	F	AB	C−3, H+2	7·1
30	2901	B	D	B−3, K+2	6·8

May 1, A (1) C (4) B.
May 3, D, B (1) C (3) K.
May 5, B (2) C (3) K.
May 8, Bn, C=B+1.
May 9, Mn, A (1) C (2) B.
May 11, D, B (4) C (1) K.
May 13, B (2) C (1) K.
May 15, 20, Bn, A (2) C (1) B.
May 16, Difficult.
May 19, Mn, C=A+1.
May 23, Bn, A (4) C (1) B.
May 24, Mn, C=A−1.
May 28, D, B (4) C (1) K.
May 29, B (3) C (2) K.
May 31, D, B (3) C (1) K. AB, With B, 6·5.
June 1, Mn, A (3) C (2) B.
June 5, D, B (3) C (2) K.
June 6, D, B (3) C (1) K. Bn, A (3) C (1) B.
June 7, Mn, C=A+0·5.
June 11, A (1) C (2) B.

June 15, 17, Bn, A (3) C (1) B.
June 16, B (2) C (2) K.
June 23, A (2) C (1) B.
June 24, D, B (1) C (3) K.
June 27, D, B (1) C (4) K.
June 28, A (3) C (1) B.
June 29, B (1) C (3) K.
July 4, D, B (2) C (2) K.
July 5, Bn, A (1) C (2) B. D, C=B.
July 8, D, B (1) C (2) K. Bn, A (1) C (2) B.
July 9, Mn, C=A.
July 10, B (2) C (2) K.
July 12, Bn, A (1) C (2) B.
July 13, B (2) C (1) K.
July 15, B (3) C (2) K.
July 20, 25, Bn, C=A+1.
July 21, C=A.
July 25, D, B (2) C (1) K.
July 26, D, B (3) C (1) K.
July 27, With B, 7·2.
July 30, B (3) C (1) K.

(7754) W CYGNI—*continued.*

1921 July					
31	2902	B	Mn	=A	6·1*b*
31	2902	F	AB	C−2, H+2	7·4*b*
31	2902	,,	Wi	=A	6·1
Aug					
1	2903	B	AB	C−1, H+4	7·2
1	2903	,,	D	K−3, G+1	6·9
2	2904	30	Bn	B+1	6·6
3	2905	B	D	K−4, G+2	6·9
4	2906	,,	AB	C−1, H+5	7·1
6	2908	45	Bh	A+1	6·0
6	2908	B	D	K−3, G+1	6·9*b*
7	2909	,,	Ma	=C	...
8	2910	30	Bn	B−1	6·8
9	2911	,,	,,	B−1·5	6·9
9	2911	B	Mn	A−1	6·2*b*
10	2912	,,	D	K−3, G+1	6·9*b*
14	2916	45	Bh	=A	6·1
15	2917	,,	,,	A−1	6·2
17	2919	,,	,,	A−1	6·2
17	2919	22	Ni	A (4) v (1·5) B	6·5
19	2921	45	Bh	A−2	6·3
23	2925	B	D	K−4, G−1, L+5	7·1*b*
24	2926	45	Bh	A+1	6·0
25	2927	30	Bn	B−1·5	6·9*b*
26	2928	B	AB	C−2, H+3	7·3
26	2928	22	Ni	=A	6·1
27	2929	B	D	G−2, L+4	7·1
28	2930	,,	,,	G−0·5, L+4	7·0
29	2931	45	Bh	=A	6·1
30	2932	B	D	=G	6·8*b*
31	2933	,,	,,	G−2, L+3	7·1
Sept					
1	2934	,,	,,	G−1, L+4	7·0
1	2934	30	Bn	B−1	6·8*b*
1	2934	22	Ni	A (5) v (2) B	6·5
2	2935	B	Ma	C+1	...
2	2935	,,	D	=G	6·8
3	2936	,,	,,	K−3, G+1	6·9
3	2936	30	Bn	B+1	6·6
4	2937	45	Bh	=A	6·1
5	2938	30	Bn	B+1	6·6
5	2938	F	AB	C−1, H+4	7·2*b*
5	2938	,,	Wi	A+1	6·0
6	2939	B	D	B−6, K−3, G+2	7·0
6	2939	F	Wi	B+2	6·5*b*
7	2940	B	Ma	C−0·5	...
7	2940	45	Bh	=A	6·1
7	2940	F	AB	C−2, H+3	7·3*b*
7	2940	,,	Wi	B+3	6·4
7	2940	B	D	=G	6·8*b*
1921 Sept					
8	2941	B	D	K−3, G+1	6·9*b*
8	2941	30	Bn	A (3) v (1) B	6·6
10	2943	F	Wi	A−2, B+4	6·3
12	2945	20	,,	A+1	6·0
12	2945	B	D	K−3, G+2	6·9*b*
14	2947	,,	,,	K−1, G+3	6·7*b*
15	2948	30	Bn	A (2) v (1) B	6·5
16	2949	22	Ni	A (3) v (3) B	6·4*b*
21	2954	45	Bh	A+1	6·0
21	2954	30	Bn	A (5) v (2) B	6·5
21	2954	B	D	=B	6·7*b*
22	2955	,,	,,	A−5, B+1	6·6*b*
22	2955	20	Wi	A−5, B+2	6·6
24	2957	F	,,	=A	6·1
24	2957	45	Bh	A+2	5·9
24	2957	30	Bn	A (2) v (1) B	6·5
24	2957	B	D	A−5, B+1	6·6
25	2958	,,	,,	B−1, K+3	6·7
27	2960	25	Bn	A (2) v (1) B	6·5
27	2960	B	D	B−3, K+2	6·8
27	2960	,,	Ma	C+1	...
28	2961	,,	,,	C+2	...
30	2963	,,	D	B−2, K+3	6·7
Oct					
1	2964	30	Bn	A (1) v (2) B	6·3
5	2968	B	D	B−2, K+2	6·8
5	2968	45	Bh	A+2	5·9
6	2969	30	Bn	A (1) v (3) B	6·3
8	2971	25	,,	A−1·5	6·3
9	2972	22	Ni	A (4·5) v (1·5) B	6·6
14	2977	25	Bn	A+1	6·0
18	2981	B	,,	A+1	6·0
18	2981	22	Ni	F (4) v (1·5) A	6·0*b*
23	2986	50	Bn	=A	6·1
23	2986	45	Bh	A+3	5·8
23	2986	B	Ma	B+1, C+2·5	6·6
28	2991	,,	,,	B+2, C+5	6·5
31	2994	45	Bh	A+3	5·8
31	2994	B	AB	A−3, C+3	6·5
Nov					
1	2995	50	Bn	A+1	6·0
6	3000	30	,,	A+2	5·9
6	3000	45	Bh	D−2, =F	5·6
7	3001	,,	,,	D−1, =F, A+6	5·5
7	3001	F	Ma	F−2, A+1, B+2, C+4	6·1
10	3004	22	Ni	F (1) v (4) A	5·7
10	3004	B	Bn	F (2) v (1) A	5·9
11	3005	45	Bh	=D	5·4
15	3009	B	Ma	C+4	...*b*

July 31, Mn, C=A+1·5. AB, With B, 7·4.
Aug. 1, 6, D, B (3) C (1) K.
Aug. 2, 8, A (1) C (2) B.
Aug. 3, B (2) C (1) K.
Aug. 7, ±.
Aug. 9, Bn, A (1) C (1) B. Mn, C=A+1.
Aug. 23, Difficult.
Aug. 25, A (2) C (1) B*b*.
Aug. 27, 31, B (3) C (2) K.
Aug. 28, B (3) C (1) K.
Aug. 30, B (2) C (2) K.
Sept. 3, D, B (3) C (2) K. Bn, A (2) C (1) B.
Sept. 5, Bn, A (2) C (1) B. AB, With B, 7·2. D, B (4) C (1) K.
Sept. 7, AB, With B, 7·3. D, G (1) C (3) L.
Sept. 8, D, K (1) C (3) G. Bn, A (1) C (1) B.
Sept. 15, A (4) C (1) B.
Sept. 21, Bn, A (3) C (1) B. D, Difficult.
Sept. 22, 28, D, K (1) C (2) G.
Sept. 24, Bn, A (3) C (1) B. D, K (1) C (3) G.
Sept. 25, K (2) C (2) G.
Sept. 27, Bn, A (3) C (1) B. D, K (2) C (2) G.
Sept. 30, K (2) C (1) G.
Oct. 1, D, C=G. Bn, A (3) C (1) B.
Oct. 5, D, K (2) C (1) G.
Oct. 6, 8, Bn, A (2) C (1) B.
Oct. 14, C=A.
Oct. 23, Bn, A (2) C (1) B.
Nov. 1, With B, 6·0.
Nov. 6, Bn, With B, 6·0. A (1) C (1) B.
Nov. 8, Bn, A (1) C (2) B.

(7754) W CYGNI—*continued.*

1921 Nov					
18	3012	B	AB	F−3·5, =A	6·0
22	3016	22	Ni	F (2) v (3) A	5·8
23	3017	30	Bn	A+1	6·0
23	3017	B	AB	F−3·5, =A	6·0
23	3017	45	Bh	D−2, =F, A+5	5·6
23	3017	B	D	A−3, B+3	6·4
23	3017	,,	Ma	A (1) v (1) B, C+10	6·4*b*
24	3018	,,	Wi	A+4, B+10	5·7
26	3020	30	Bn	A+1	6·0
26	3020	45	Bh	D−3, A+4	5·7
28	3022	B	Wi	A+3	5·8
30	3024	22	Ni	F (1·5) v (4) A	5·7
Dec					
3	3027	45	Bh	A+4	5·7
4	3028	30	Bn	A+2	5·9
4	3028	B	D	A−3, B+2	6·5
6	3030	F	AB	F−3, A+3	5·8
7	3031	B	Ma	A (3) v (1) B, C+6	6·6
15	3039	45	Bh	A+2	5·9
17	3041	B	Wi	A+3, B+10	5·8
17	3041	,,	Ma	A (1) v (3) B, C+5	6·3
18	3042	,,	D	A−2, B+4	6·3*b*
20	3044	45	Bh	A+2	5·9
20	3044	30	Bn	A+1	6·0
20	3044	B	Wi	=A	6·1
21	3045	,,	,,	A+2	5·9
21	3045	25	AB	=A, C+5	6·1*b*
22	3046	30	Bn	A+1	6·0
23	3047	45	Bh	A+2	5·9
24	3048	22	Ni	F (1) v (4) A	5·7
25	3049	30	Bn	A+1·5	6·0
25	3049	45	Bh	A+2	5·9
28	3052	,,	,,	A+1	6·0
28	3052	30	Bn	A+1·5	6·0
29	3153	B	Ma	A (3) v (1) B, B+3	6·5
29	3053	22	Ni	F (2) v (3) A	5·8
30	3054	45	Bh	=A	6·1
31	3055	30	Bn	A+1·5	6·0
1922 Jan					
1	3056	45	Bh	=A	6·1
1	3056	B	Ma	B+2, C+3	6·5
3	3058	30	Bn	A+1·5	6·0
6	3061	22	Ni	F (1) v (4) A	5·7
6	3061	45	Bh	A+1	6·0
8	3063	,,	,,	=A	6·1
10	3065	,,	,,	=A	6·1
10	3065	30	Bn	A+0·5	6·1
10	3065	B	D	A−4, B+2	6·5*b*
10	3065	,,	Ma	B+2·5, C+1	6·5*b*
10	3065	,,	Wi	=A	6·1*b*
13	3068	45	Bh	A−1	6·2
16	3071	30	Bn	A (1) v (3) B	6·3
18	3073	45	Bh	A−2	6·3
1922 Jan					
20	3075	45	Bh	A−2	6·
20	3075	B	Wi	A−4, B+2	6·
23	3078	,,	D	B+1	6·
24	3079	45	Bh	=A	6·
26	3081	22	Ni	A (4) v (2·5) B	6·
28	3083	45	Bh	A+1	6·
29	3084	,,	,,	=A	6·
30	3085	,,	,,	A+1	6·
Feb					
1	3087	50	Bn	A (2) v (1) B	6·
2	3088	45	Bh	A−1	6·
5	3091	,,	,,	A−2	6·
7	3093	B	Ma	=B, C−2	6·
9	3095	,,	,,	<C	··
9	3095	22	Ni	A (4) v (2·5) B	6·
10	3096	45	Bh	A−2	6·
11	3097	25	Bn	A (3) v (1) B	6·
17	3103	30	,,	A (1) v (1) B	6·
17	3103	45	Bh	A−2	6·
20	3106	,,	,,	=A	6·
25	3111	25	Bn	A (1) v (2) B	6·
25	3111	B	D	B−1·5	6·
25	3111	22	Ni	=B	6·
26	3112	45	Bh	A+1	6·
27	3113	22	Ni	A (4) v (2) B	6·
Mar					
2	3116	45	Bh	A+3	5·
4	3118	,,	,,	D−2, =F, A+4	5·
14	3128	,,	,,	D−2, =F	5·
19	3133	,,	,,	=F, A+3	5·
20	3134	22	Ni	A−0·5	6·
20	3134	B	D	A−5, B+1	6·
28	3142	45	Bh	A+3	5·
31	3145	22	Ni	=A	6·
Apr					
4	3149	45	Bh	A+2	5·
14	3159	,,	,,	A+1	6·
17	3162	30	Bn	A+1	6·
18	3163	45	Bh	=A	6·
19	3164	30	Bn	A+1	6·
19	3164	22	Ni	=A	6·
24	3169	30	Bn	A+1	6·
29	3174	,,	,,	A−1	6·
29	3174	45	Bh	A+1	6·
May					
2	3177	50	Bn	A (1) v (2) B	6·
2	3177	45	Bh	A+1	6·
4	3179	33	Wi	=A	6·
6	3181	B	,,	A−4, B+2	6·
6	3181	16	Bn	A (2) v (1) B	6·
8	3183	33	Wi	A+1	6·
8	3183	45	Bh	A+2	5·
12	3187	,,	,,	A+3	5·
14	3189	30	Bn	A (1) v (1) B	6·
14	3189	B	Wi	B−2	6·
15	3190	,,	D	A−4, B+2	6·
17	3192	45	Bh	D−3, F−1, A+3	5·
19	3194	F	Wi	A−1, B+5	6·
19	3194	30	Bn	A (2) v (3) B	6·
20	3195	B	D	A−3, B+2	6·
21	3196	50	Bn	A (1) v (1) B	6·
21	3196	45	Bh	F−1, A+4	5·

Nov. 23, Dec. 4, 22, 25. Bn. With B, 6·0.
Dec. 28. Bn. With B, 6·0. A (2) C (3) B.
Dec. 30, Pale yellow.
Dec. 31, With B, 6·0.
D notes: "Comparison star C always difficult to observe in B, but irregular variation with long periods of steady light fairly certain."
Jan. 3, A (2) C (1) B.
Jan. 10, Bn. A (1) C (1) B.
Jan. 16, A (3) C (1) B.

Feb. 11, A (3) C (2) B.
Feb. 17, Bn, A (3) C (4) B.
Feb. 25, Bn. A (3) C (1) B. Ni, Approximate
April 17, With B, 6·0.

(7754) W CYGNI—*continued.*

1922 May					
22	3197	B	D	A−4, B+2	6·5
23	3198	22	Ni	F (3) v (1) A	6·0
23	3198	25	Bn	A (2) v (3) B	6·4
26	3201	45	Bh	D−1, F+1, A+6	5·5
27	3202	30	Bn	A (1) v (2) B	6·3
28	3203	B	D	A−1, B+5	6·2
28	3203	22	Ni	F (2) v (3) A	5·8
28	3203	B	Wi	A−3, B+4	6·4
31	3206	45	Bh	D−2, =F, A+5	5·6
June					
1	3207	30	Bn	A+1	6·0
4	3210	,,	,,	A+1·5	6·0
5	3211	22	Ni	D−4, F+2, A+6	5·6*b*
6	3212	25	Bn	A+2	5·9
8	3214	45	Bh	D−1, F+1, A+6	5·5
10	3216	,,	,,	D−1, F+1, A+6	5·5
12	3218	,,	,,	=D, F+2, A+6	5·4
12	3218	B	D	E−6, A+2	5·9
15	3221	45	Bh	=D	5·4
20	3226	B	D	E−5, A+2	5·9*b*
22	3228	45	Bh	D−1, F+1	5·5
26	3232	,,	,,	D−2, =F	5·6
29	3235	,,	,,	D−2, =F	5·6
29	3235	B	D	E−6, A+1	6·0
July					
2	3238	45	Bh	D−2, A+5	5·6
5	3241	,,	,,	=F	5·5
12	3248	22	Ni	F (4) v (3) A	5·9
14	3250	45	Bh	D−1, F+1	5·5
18	3254	,,	,,	D−1, F+1	5·5
18	3254	30	Bn	F (2) v (1) A, A+2	5·9
20	3256	,,	,,	A+1	6·0
22	3258	45	Bh	=F, A+4	5·6
24	3260	B	Ma	=B, >C	6·7*b*
27	3263	45	Bh	F−1, A+3	5·7
27	3263	B	D	A−4, B+1	6·6
28	3264	,,	,,	A−3, B+2	6·5
28	3264	,,	Bn	A (1) v (3) B	6·3
29	3265	,,	D	A−4, B+2	6·5
30	3266	30	Bn	A (1) v (3) B	6·3
31	3267	B	Ma	A (4) v (1) B, C+5	6·6
31	3267	45	Bh	A+3	5·8
Aug					
7	3274	22	Ni	F (2) v (3) A	5·8*b*
7	3274	30	Bn	A (1) v (2) B	6·3
11	3278	B	Ma	=B, C+3·5	6·7*b*
11	3278	45	Bh	A+2	5·9
15	3282	30	Bn	A (1) v (3) B	6·3
15	3282	B	D	A−4, B+2	6·5*b*
16	3283	22	Ni	F (3) v (3) A	5·8
17	3284	B	Ma	=B, C+4	6·7
19	3286	45	Bh	A+1	6·0
20	3287	B	Wi	A−3, B+3	6·4
20	3287	,,	Ma	B+1, C+5	6·6
20	3287	30	Bn	A−1	6·2
23	3290	,,	,,	A (1) v (4) B	6·2
23	3290	45	Bh	A+1	6·0
25	3292	,,	,,	A+1	6·0
25	3292	30	Bn	=A	6·1
25	3292	B	Ma	=B, C+4	6·7
25	3292	22	Ni	F (3) v (2·5) A	5·9
26	3293	B	Wi	A−3, B+2	6·5
28	3295	,,	D	A−1, B+5	6·2
1922 Aug					
31	3298	30	Bn	A+1	6·0
31	3298	45	Bh	A+1	6·0
Sept					
7	3305	,,	,,	=A	6·1
7	3305	30	Bn	A+1·5	6·0
9	3307	,,	,,	A+1	6·0
9	3307	B	Ma	A (1) v (3) B, C+4	6·6
10	3308	45	Bh	=A	6·1
10	3308	B	D	A−2, B+4	6·3*b*
10	3308	22	Ni	F (3) v (2) A	5·9
11	3309	30	Bn	A+1	6·0
11	3309	B	Ma	A (1) v (1) B, B+2, C+4	6·4
12	3310	,,	D	A−3, B+3	6·4
13	3311	,,	Wi	A−3, B+3	6·4
15	3313	30	Bn	A+0·5	6·1
15	3313	45	Bh	=A	6·1
15	3313	B	Ma	B+1, C+6	6·6
18	3316	22	Ni	F (4) v (1) A	6·0
20	3318	B	Wi	A+1	6·0
20	3318	50	Bn	A (1) v (4) B	6·2
21	3319	45	Bh	=A	6·1
24	3322	30	Bn	A (1) v (2) B	6·3
24	3322	B	Ma	B+1, C+6	6·6
26	3324	45	Bh	A+1	6·0
26	3324	B	D	A−1, B+5	6·2
28	3326	,,	,,	A−4, B+1	6·5
29	3327	30	Bn	A (2) v (3) B	6·4
30	3328	B	D	A−5, B+1	6·6*b*
Oct					
2	3330	45	Bh	A−1	6·2
4	3332	,,	,,	A−1	6·2
6	3334	30	Bn	A (2) v (1) B	6·5
6	3334	B	Ma	=B, C+4	6·7*b*
6	3334	22	Ni	F (3) v (1) A	6·0*b*
7	3335	45	Bh	A−1	6·2
11	3339	,,	,,	A−2	6·3
12	3340	50	Bn	A (1) v (2) B	6·3
12	3340	B	Wi	B+2	6·5
13	3341	,,	,,	=A	6·1
13	3341	,,	D	A−4, B+2	6·5
13	3341	45	Bh	A−1	6·2
14	3342	B	Wi	A−2, B+3	6·4
14	3342	50	Bn	A (2) v (3) B	6·4
15	3343	B	D	A−4, B+2	6·5
15	3343	22	Ni	=A	6·1
16	3344	B	Ma	B−1, C+4	6·8
17	3345	,,	D	A−5, B+1	6·6
18	3346	90	Bh	A−2	6·3
18	3346	50	Bn	A (1) v (3) B	6·3
22	3350	30	,,	A (1) v (3) B	6·3
22	3350	B	D	A−4, B+2	6·5
22	3350	22	Ni	A−0·5	6·2
25	3353	B	Wi	B+1	6·6
25	3353	45	Bh	A−2	6·3
27	3355	50	Bn	A (1) v (3) B	6·3
28	3356	45	Bh	A−3	6·4
Nov					
1	3360	B	Ma	B−1, C+2	6·8*b*
1	3360	50	Bn	A+1	6·0
4	3363	B	,,	F (3) v (1) A	6·0
4	3363	45	Bh	A−3	6·4
6	3365	33	Wi	A−1·5	6·3
9	3368	45	Bh	A−3	6·4

July 20, With B, 5·9.
Aug. 7, Ni, 6c.

Aug. 31, Sept. 7, 9, 11, Nov. 1, Bn, With B, 6·0.
Sept. 15, Bn, With B, 6·1. Ma, Reddish.

(7754) W CYGNI—*continued.*

1922 Nov					
13	3372	B	Ma	B+2, C+6	6·5
15	3374	,,	Bn	F (4) v (1) A	6·0
15	3374	22	Ni	F (4) v (1) A	6·0
17	3376	45	Bh	A−2	6·3
18	3377	B	Bn	F (4) v (1) A	6·0
23	3382	30	,,	F (4) v (1) A	6·0
23	3382	B	Ma	B+2, C+2	6·5
24	3383	22	Ni	F (4) v (2) A	5·9
24	3383	45	Bh	A−1	6·2
28	3387	,,	,,	=A	6·1
29	3388	30	Bn	F (3) v (1) A	6·0
29	3388	50	Ma	C+2	...
Dec					
1	3390	45	Bh	=A	6·1
1	3390	50	Bn	A+1·5	6·0
6	3395	30	,,	F (2) v (1) A	5·9
6	3395	B	Ma	B+3, C+3	6·4*b*
6	3395	22	Ni	=F	5·5
6	3395	45	Bh	A+1	6·0
9	3398	,,	,,	A+1	6·0
12	3401	,,	,,	A+1	6·0
14	3403	22	Ni	=F	5·5*b*
16	3405	45	Bh	=A	6·1
18	3407	,,	,,	A+1	6·0
18	3407	30	Bn	F (3) v (1) A	6·0
20	3409	,,	,,	F (4) v (1) A	6·0
20	3409	22	Ni	F (3) v (2·5) A	5·9
20	3409	B	Wi	A−2, B+5	6·3
23	3412	30	Bn	F (3) v (1) A, A+1	6·0
25	3414	45	Bh	=A	6·1*b*
26	3415	B	Wi	A+2	5·9
26	3415	,,	D	A−2, B+3	6·4*b*
26	3415	30	Bn	F (4) v (1) A	6·0
1923 Jan					
3	3423	,,	,,	F (3) v (1) A	6·0
4	3424	B	Ma	B+4, C+2	6·3
4	3424	45	Bh	A+1	6·0
6	3426	,,	,,	A+1	6·0
6	3426	22	Ni	F (3) v (3) A	5·8
6	3426	B	Wi	A−1	6·2
8	3428	45	Bh	A+2	5·9
8	3428	30	Bn	F (4) v (1) A	6·0
9	3429	B	Ma	B+3, C+2	6·4
9	3429	,,	Wi	A+1·5	6·0
10	3430	30	Bn	F (3) v (1) A	6·0
11	3431	45	Bh	A+2	5·9
12	3432	B	Ma	A (3) v (1) B, C+3	6·6
14	3434	45	Bh	A+1	6·0
14	3434	30	Bn	F (5) v (2) A	6·0
14	3434	22	Ni	D (5) v (1) F	5·5*b*
16	3436	,,	,,	F (3) v (3) A	5·8
18	3438	B	Bn	F (2) v (1) A	5·9
18	3438	45	Bh	A+1	6·0
20	3440	B	Ma	A (3) v (1) B, C+4	6·6
1923 Jan					
20	3440	30	Bn	F (2) v (1) A	5·9
23	3443	,,	,,	F (3) v (2) A	5·9
24	3444	45	Bh	A+2	5·9
30	3450	,,	,,	A+4	5·7
Feb					
3	3454	,,	,,	A+5	5·6
4	3455	,,	,,	=D, A+5	5·5
4	3455	30	Bn	F (3) v (1) A	6·0
6	3457	B	D	A−3, B+3	6·4
6	3457	22	Ni	F (2·5) v (4) A	5·8
8	3459	45	Bh	A+5	5·6
11	3462	30	Bn	A+0·5	6·1
16	3467	45	Bh	A+3	5·8
17	3468	22	Ni	F (3) v (3) A	5·8
25	3476	50	Bn	A−0·5	6·2
26	3477	22	Ni	F (3) v (2) A	5·9
27	3478	45	Bh	D−1, A+4	5·6
Mar					
2	3481	,,	,,	A+3	5·8
4	3483	50	Bn	A (1) v (2) B	6·3
5	3484	45	Bh	A+3	5·8
13	3492	,,	,,	A+2	5·9
15	3494	,,	,,	A+2	5·9
16	3495	22	Ni	F (3) v (1·5) A	5·9
17	3496	45	Bh	A+1	6·0
25	3504	,,	,,	=A	6·1
26	3505	B	D	A−3, B+2	6·5
Apr					
1	3511	22	Ni	F (2) v (2) A	5·9
4	3514	,,	,,	A+1	6·0
8	3518	B	D	A−3, B+2	6·5
9	3519	45	Bh	A−1	6·2
13	3523	B	Bn	F (2) v (1) A	5·9
13	3523	45	Bh	=A	6·1
14	3524	22	Ni	F (1·5) v (3) A	5·7
17	3527	45	Bh	A−1	6·2
19	3529	B	D	A+1	6·0
20	3530	30	Bn	F (3) v (1) A	6·0
20	3530	22	Ni	D−5, F+1, A+4	5·7
22	3532	45	Bh	=A	6·1
24	3534	B	D	E−6, A+2	5·9
26	3536	30	Bn	F (3) v (1) A	6·0
27	3537	B	D	E−5, A+2	5·9
27	3537	45	Bh	A−1	6·2
May					
1	3541	,,	,,	A−1	6·2
3	3543	,,	,,	=A	6·1
4	3544	B	D	E−6, A+1	6·0
5	3545	,,	,,	E−5, A+2	5·9
5	3545	30	Bn	A+1	6·0
5	3545	22	Ni	D (4·5) v (1·5) F	5·5
7	3547	45	Bh	A−1	6·2
9	3549	,,	,,	=A	6·1
11	3551	B	Wi	=A	6·1
13	3553	,,	D	A+1	6·0
14	3554	,,	,,	E−6, A+2	5·9
16	3556	45	Bh	A+2	5·9
17	3557	30	Bn	F (2) v (1) A	5·9
18	3558	22	Ni	F (2) v (3) A	5·8
19	3559	45	Bh	A+2	5·9
21	3561	,,	,,	D−2, A+4	5·7
21	3561	B	Bn	F (3) v (1) A	6·0
24	3564	,,	D	E−6, A+2	5·9

Nov. 13, Pale yellow.
Nov. 29, Ma, Pale red.
Dec. 6, Bn, With B, 5·9. Ni, Approximately.
Dec. 18, 23, 26, Bn, With B, 6·0.
Bh remarks with regard to the year 1922 as a whole that the colour of the variable is orange-red with little variation.
Jan. 3, 10, With B, 6·0.
Jan. 8, 14, Bn, With B, 6·0.

Jan. 20, 23, Bn, With B, 5·9.
Feb. 4, Bn, With B, 6·0.
May 17, With B, 5·9.

(7754) W CYGNI—*continued.*

1923 May					
25	3565	B	D	E−6, A+2	5·9
25	3565	30	Bn	F (2) v (1) A	5·9
29	3569	45	Bh	=D, F+2	5·4
June					
2	3573	,,	,,	D−2, =F	5·6
4	3575	B	D	A−3, B+3	6·4*b*
6	3577	,,	,,	A−2, B+4	6·3
10	3581	,,	,,	A−4, B+2	6·5
11	3582	45	Bh	D−1, F+1	5·5
11	3582	30	Bn	A (1) v (4) B	6·2
18	3589	B	D	A−5, B+1	6·6
21	3592	45	Bh	=F	5·5
23	3594	,,	,,	D−2, =F, A+5	5·6
26	3597	B	D	A−4, B+2	6·5
July					
1	3602	45	Bh	D−2, A+3	5·7
4	3605	50	Bn	A (1) v (4) B	6·2
4	3605	22	Ni	A (1) v (4) B	6·2*b*
4	3605	B	D	A−3, B+3	6·4
5	3606	,,	,,	A−3, B+2	6·5*b*
6	3607	30	Bn	A (1) v (3) B	6·3
7	3608	B	D	A−4, B+2	6·5
8	3609	50	Bn	A (1) v (3) B	6·3
9	3610	22	Ni	=A	6·1*b*
12	3613	B	D	A−3, B+3	6·4
13	3614	,,	,,	A−4, B+2	6·5
14	3615	,,	,,	A−4, B+1	6·6
16	3617	,,	,,	A−4, B+2	6·5
20	3621	,,	,,	A−1, B+4	6·3
20	3621	50	Bn	A (1) v (4) B	6·2
20	3621	45	Bh	A+2	5·9
20	3621	B	Ma	=B, C+3	6·7
24	3625	50	Bn	A (1) v (3) B	6·3
26	3627	45	Bh	A+1	6·0
27	3628	22	Ni	F (3) v (2) A	5·9*b*
28	3629	50	Bn	A (2) v (1) B	6·5
30	3631	45	Bh	=A	6·1
Aug					
1	3633	,,	,,	A+1	6·0
2	3634	B	Ma	=B, C+7	6·7
3	3635	45	Bh	A+1	6·0
3	3635	F	Bn	F (3) v (1) A	6·0
4	3636	22	Ni	F (3) v (3) A	5·8*b*
7	3639	B	Ma	B−2, C+4	6·9
8	3640	F	Bn	F (4) v (1) A	6·0
9	3641	45	Bh	A+1	6·0
11	3643	,,	,,	=A	6·1
11	3643	50	Bn	A+2	5·9
11	3643	B	D	=B	6·7
12	3644	,,	Ma	=B, C+4	6·7
13	3645	25	Bn	F (5) v (2) A, A+2	5·9
15	3647	B	D	=A	6·1
18	3650	25	Bn	F (2) v (1) A	5·9
18	3650	45	Bh	=A	6·1
22	3654	,,	,,	A+2	5·9
22	3654	B	D	E−5, A+2	5·9
24	3656	F	Bn	F (1) v (3) A	5·7
27	3659	45	Bh	A+2	5·9
28	3660	F	Bn	F (2) v (1) A	5·9
1923 Aug					
30	3662	45	Bh	A−2	6·3
31	3663	B	Ma	=B, C+5	6·7
Sept					
1	3664	,,	D	E−6, A+2	5·9
3	3666	,,	,,	E−5, A+1·5	5·9
3	3666	22	Ni	F (1) v (4) A	5·7*b*
5	3668	30	Bn	F (3) v (2) A	5·9
6	3669	B	D	A−1, B+5	6·2
7	3670	45	Bh	A−1	6·2
8	3671	25	Bn	F (2) v (1) A	5·9
8	3671	B	D	E−5, A+1	5·9
11	3674	,,	,,	E−5, A+3	5·8
11	3674	,,	Bn	F (3) v (2) A	5·9
12	3675	,,	D	E−5, A+2	5·9
12	3675	22	Ni	D (2) v (3) F	5·4*b*
16	3679	45	Bh	A−2	6·3
16	3679	B	Ma	A (1) v (1) B, C+7	6·4
16	3679	F	Bn	F (1) v (3) A	5·7
16	3679	B	Wi	A+3	5·8
17	3680	,,	,,	A−1	6·2
18	3681	,,	,,	A+2	5·9
18	3681	,,	D	=A	6·1
21	3684	,,	,,	E−5, A+2	5·9
21	3684	,,	Wi	A+1	6·0*b*
21	3684	,,	Bn	D (3) v (1) F	5·5
22	3685	45	Bh	A−2	6·3
23	3686	B	Bn	D (3) v (1) F	5·5
23	3686	,,	D	E−5, A+2	5·9
26	3689	45	Bh	A−1	6·2
29	3692	B	Bn	F (1) v (1) A	5·8
30	3693	,,	D	E−5, A+2	5·9
30	3693	22	Ni	D (4·5) v (1·5) F	5·5*b*
30	3693	B	Wi	A+1	6·0
Oct					
1	3694	45	Bh	=A	6·1
4	3697	,,	,,	=A	6·1
4	3697	25	Bn	F (2) v (1) A	5·9
5	3698	45	Bh	A+1	6·0
12	3705	22	Ni	F (3) v (3) A	5·8*b*
12	3705	B	Ma	=B, C+4·5	6·7
13	3706	,,	D	A−4, B+2	6·5
14	3707	50	Bn	A+1·5	6·0
15	3708	B	D	A−3, B+2	6·5
19	3712	45	Bh	A+2	5·9
21	3714	,,	,,	D−3, A+3	5·8
21	3714	B	Ma	A (1) v (1) B, C+7	6·4
21	3714	,,	Wi	A−1	6·2
22	3715	,,	,,	A+1	6·0
22	3715	50	Bn	A+1	6·0
23	3716	45	Bh	A+3	5·8
24	3717	50	Bn	A+0·5	6·1
25	3718	45	Bh	D−3, A+3	5·8
27	3720	B	Wi	=A	6·1
28	3721	,,	D	A−2, B+4	6·3*b*
28	3721	50	Bn	=A	6·1
29	3722	22	Ni	F (5) v (0·5) A	6·1
31	3724	10	Wi	A−2	6·3
Nov					
2	3726	B	D	A−4, B+1·5	6·5*b*
2	3726	10	Wi	A+1	6·0
3	3727	,,	,,	A−4	6·5
3	3727	50	Bn	A+1	6·0
3	3727	45	Bh	D−4, A+2	5·9
4	3728	10	Wi	A−1	6·2
6	3730	B	Ma	=B, C+4	6·7

May 25, Aug. 11, Bn, With B, 5·9.
Aug. 2, About.
Aug. 3, Bn, With B, 6·0.
Aug. 8, With B, 6·0.
Aug. 12, Difficult.
Aug. 24, With B, 5·7.
Aug. 28, With B, 5·9.

Sept. 16, Bn, With B, 5·7.

(7754) W CYGNI—*continued.*

1923 Nov					
7	3731	45	Bh	A+1	6·0
7	3731	B	Wi	A−4	6·5
8	3732	22	Ni	F (4) v (1) A	6·0
8	3732	45	Bh	A+2	5·9
10	3734	,,	,,	A+1	6·0
10	3734	50	Bn	A (1) v (2) B	6·3
10	3734	B	Ma	B+1, C+4	6·6
11	3735	10	Wi	A+1	6·0
13	3737	B	D	A−5, B+1	6·6*b*
14	3738	10	Wi	A+1	6·0
14	3738	50	Bn	A (2) v (3) B	6·4
16	3740	,,	,,	A (1) v (3) B	6·3
16	3740	45	Bh	A+1	6·0
16	3740	22	Ni	F (4) v (2·5) A	5·9
16	3740	B	Wi	A+1	6·0*b*
17	3741	,,	,,	=A	6·1
18	3742	,,	Ma	B+2, C+3	6·5*b*
18	3742	50	Bn	A (1) v (3) B	6·3
23	3747	,,	,,	A+1	6·0
30	3754	,,	,,	F (2) v (1) A, A+2	5·9
30	3754	45	Bh	=A	6·1
Dec					
2	3756	,,	,,	=A	6·1
2	3756	50	Bn	F (3) v (2) A, A+2·5	5·9
2	3756	10	Wi	A+1	6·0
3	3757	B	Ma	B+2, C+3	6·5*b*
4	3758	,,	,,	B+1, C+3	6·6
4	3758	10	Wi	A+1	6·0
4	3758	F	Bn	F (2) v (1) A	5·9
4	3758	45	Bh	A−1	6·2
8	3762	,,	,,	A+1	6·0
9	3763	10	Wi	A+1	6·0
9	3763	22	Ni	F (4) v (2) A	5·9
9	3763	B	Ma	A (1) v (1) B, B+4, C+5	6·4
9	3763	,,	D	E−5, A+2, C+5	5·9
10	3764	,,	,,	A+1	6·0*b*
12	3766	45	Bh	A−1	6·2
15	3769	F	Bn	F (1) v (1) A	5·8
18	3772	50	,,	F (3) v (2) A	5·9
18	3772	45	Bh	A−1	6·2
22	3776	,,	,,	A+1	6·0
23	3777	F	Bn	F (1) v (2) A	5·7
24	3778	45	Bh	A+2	5·9
28	3782	,,	,,	A+1	6·0
30	3784	B	D	A+1	6·0
30	3784	22	Ni	F (3) v (3) A	5·8
1924 Jan					
2	3787	B	Bn	D (2) v (1) F	5·5
3	3788	45	Bh	A+1	6·0
5	3790	,,	,,	D−4, A+3	5·8
5	3790	10	Wi	A+4	5·7
6	3791	,,	,,	A+5	5·6
6	3791	22	Ni	D (4) v (1) F	5·5
6	3791	B	D	A−2, B+4	6·3
6	3791	F	Bn	F (1) v (3) A	5·7
7	3792	45	Bh	D−3, A+3	5·8
7	3792	B	D	E−6, A+1	6·0

Nov. 18, Dec. 3, Ma, Very difficult.
Dec. 4, Wi. Confirmed with B. Bn, With B, 5·9.
Dec. 15, With B, 5·8.
Dec. 23, With B, 5·7. Ni remarks for the year's obs.:—"Estimates difficult on account of strong colour of star and remoteness of comparison stars."

1924 Jan					
9	3794	F	Bn	F (2) v (1) A	5·9
11	3796	B	D	E−5, A+1	5·9
14	3799	,,	Bn	F (5) v (2) A	6·0
15	3800	22	Ni	F (1) v (5) A	5·6
16	3801	45	Bh	A+3	5·8
20	3805	50	Bn	F (3) v (1) A, A+1·5	6·0
20	3805	10	Wi	A+5	5·6
20	3805	B	D	E−5, A+2	5·9
23	3808	,,	,,	E−5, A+2	5·9
23	3808	22	Ni	F (2) v (3) A	5·8
23	3808	45	Bh	A+3	5·8
25	3810	,,	,,	A+2	5·9
25	3810	50	Bn	F (1) v (1) A, A+3	5·8
25	3810	10	Wi	A+5	5·6
27	3812	,,	,,	D−5, A+2	5·9
27	3812	50	Bn	F (1) v (2) A, A+4	5·7
27	3812	B	D	A+0·5	6·1
28	3813	,,	,,	A+2	5·9
29	3814	50	Bn	F (1) v (1) A, A+3	5·8
31	3816	40	D	A+3	5·8
Feb					
1	3817	50	Bn	F (1) v (2) A, A+4	5·7
1	3817	B	D	E−4, A+2	5·8
2	3818	,,	,,	A+2	5·9
4	3820	45	Bh	A+1	6·0
4	3820	50	Bn	F (1) v (3) A, A+5	5·7
8	3824	B	D	E−5, A+3	5·8
11	3827	45	Bh	X+4	6·1
14	3830	50	Bn	F (1) v (1) A, A+3	5·8
14	3830	45	Bh	X+5	6·0
14	3830	22	Ni	D (4) v (1) F	5·5
14	3830	B	D	E−5·5, A+1	6·0
16	3832	,,	,,	E−5, A+2	5·9
17	3833	50	Bn	F (1) v (1) A, A+3	5·8
22	3838	,,	,,	F (2) v (1) A, A+2	5·9
22	3838	45	Bh	A+2	5·9
24	3840	,,	,,	X+4	6·1
26	3842	50	Bn	A+1·5	6·0
27	3843	45	Bh	A+1·5	6·0
28	3844	B	D	E−6, A+1	6·0
28	3844	22	Ni	F (3) v (2) A	5·9
Mar					
1	3846	45	Bh	X+3	6·2
2	3847	50	Bn	A+1	6·0
4	3849	45	Bh	X+3	6·2
4	3849	B	D	E−6, A+1	6·0
6	3851	22	Ni	F (2) v (2·5) A	5·8
7	3852	50	Bn	A+1	6·0
7	3852	45	Bh	A+3	5·8
7	3852	B	D	E−6, A+2	5·9
8	3853	,,	,,	A+1	6·0
9	3854	50	Bn	A+0·5	6·1
9	3854	10	Wi	A+1	6·0
10	3855	B	D	=A	6·1
10	3855	45	Bh	A+3	5·8
11	3856	,,	,,	X+4	6·1
11	3856	B	D	A−1, B+5	6·2
11	3856	10	Wi	A+4	5·7
13	3858	B	D	A−1, B+5	6·2
13	3858	50	Bn	A (1) v (3) B	6·3
14	3859	45	Bh	X+4	6·1
16	3861	B	D	A−1·5, B+4	6·3
16	3861	22	Ni	=A	6·1

Jan. 9, With B, 5·9.
Jan 15, 23, Ni, Difficult.
Feb. 4, Bn, With B, 5·7.

(7754) W CYGNI—*continued.*

1924					
Mar					
22	3867	45	Bh	X+2	6·3
26	3871	,,	,,	A (1) v (1) X	6·3
29	3874	30	Bn	A (3) v (2) B	6·5
30	3875	B	D	A−3, B+3	6·4
Apr					
1	3877	10	Wi	A+3	5·8
1	3877	30	Bn	A (2) v (1) B	6·5
2	3878	45	Bh	=A	6·1
2	3878	22	Ni	F (4) v (2) A	5·9
4	3880	B	D	A−2, B+4	6·3
4	3880	75	Bn	A (4) v (7) B	6·3
7	3883	30	,,	A (1) v (3) B	6·3
8	3884	10	Wi	A+3	5·8
9	3885	,,	,,	A+4	5·7
9	3885	30	Bn	A−2	6·3
11	3887	B	D	A−3, B+3	6·4
14	3890	45	Bh	A−1	6·2
17	3893	22	Ni	F (4) v (2) A	5·9
20	3896	25	Bn	F (3) v (1) A	6·0
25	3901	45	Bh	A−1, X+3	6·2
25	3901	B	D	E−5, A+2	5·9*b*
27	3903	10	Wi	=A	6·1
May					
1	3907	,,	,,	A+2	5·9*b*
1	3907	B	D	A−4, B+2	6·5*b*
4	3910	,,	,,	=A	6·1
5	3911	,,	,,	E−6, A+1	6·0
5	3911	50	Bn	A+1	6·0
5	3911	45	Bh	=A	6·1
5	3911	22	Ni	F (3) v (2) A	5·9
5	3911	10	Wi	A+3, B+9	5·8
7	3913	B	D	E−6, A+1	6·0
9	3915	,,	,,	E−6, A+1	6·0
13	3919	,,	,,	E−5, A+3	5·8
13	3919	22	Ni	F (1·5) v (3) A	5·7
13	3919	45	Bh	=A	6·1
16	3922	,,	,,	=A	6·1
16	3922	50	Bn	F (1) v (1) A	5·8
19	3925	F	,,	F (2) v (1) A	5·9
21	3927	B	D	E−5, A+3	5·8
22	3928	45	Bh	A+1	6·0
23	3929	B	D	E−5, A+3	5·8
24	3930	,,	,,	E−6, A+2	5·9
25	3931	,,	,,	A+1	6·0
25	3931	22	Ni	F (1) v (4) A	5·7
27	3933	25	Bn	F (2) v (1) A	5·9
27	3933	B	D	A+1	6·0
29	3935	,,	,,	E−6, A+2	5·9
30	3936	,,	,,	E−6, A+1·5	6·0
June					
1	3938	,,	,,	E−6, A+2	5·9
3	3940	,,	,,	E−6, A+3	5·9
5	3942	,,	,,	E−6, A+2	5·9
11	3948	,,	,,	A+1	6·0
12	3949	,,	,,	E−6, A+2	5·9
13	3950	25	Bn	D (3) v (1) F	5·5
13	3950	45	Bh	D−4, A+3	5·8
15	3952	B	D	E−6, A+2	5·9
16	3953	,,	,,	A+1	6·0
17	3954	,,	,,	A+2	5·9
20	3957	25	Bn	F (1) v (2) A	5·7
22	3959	B	D	E−6, A+1	6·0
23	3960	,,	,,	E−6, A+2	5·9
24	3961	45	Bh	A+3	5·8
26	3963	B	D	=A	6·1

April 2, May 5, 25, Ni, Difficult.

1924					
June					
27	3964	45	Bh	A+3	5·8
29	3966	B	D	A−1, B+4	6·3
30	3967	,,	,,	A−1	6·2*b*
30	3967	45	Bh	=F, A+4	5·6
July					
1	3968	B	D	A+1	6·0
2	3969	,,	,,	A−1	6·2*b*
2	3969	22	Ni	F (3) v (3) A	5·8
5	3972	B	D	A−1, B+4	6·3
9	3976	,,	,,	A−3, B+2	6·5
9	3976	22	Ni	F (3) v (3) A	5·8
9	3976	45	Bh	A+2	5·9*b*
10	3977	25	Bn	F (3) v (1) A	6·0
10	3977	B	D	A−3, B+3	6·4
11	3978	,,	,,	A−1, B+4	6·3
11	3978	45	Bh	A+2	5·9
13	3980	50	Bn	A+1	6·0
13	3980	B	D	A−2, B+3	6·4
14	3981	,,	,,	=A	6·1
14	3981	,,	Ma	A (2) v (1) B, C+4	6·5
18	3985	,,	,,	A (2) v (1) B, C+7	6·5
19	3986	25	Bn	A+0·5	6·1
22	3989	B	Ma	B−1, C+4	6·8
24	3991	,,	,,	=B, C+3	6·7
24	3991	45	Bh	A+3	5·8
24	3991	25	Bn	A (1) v (2) B	6·3
29	3996	,,	,,	A (1) v (2) B	6·3
30	3997	45	Bh	A+3	5·8
30	3997	22	Ni	F (5) v (2) A	6·0
31	3998	B	D	E−5, A+1	5·9*b*
Aug					
2	4000	,,	Ma	B+2, C+5	6·5
2	4000	25	Bn	A (2) v (3) B	6·4
5	4003	,,	,,	A (1) v (2) B	6·3
8	4006	30	,,	A (1) v (3) B	6·3
8	4006	B	D	E−5, A+2	5·9
12	4010	25	Bn	A (1) v (4) B	6·2
13	4011	B	D	E−5, A+2	5·9
15	4013	,,	,,	E−6, A+2	5·9
15	4013	45	Bh	=X	6·5
17	4015	B	D	E−5, A+2·5	5·9
19	4017	10	Wi	A+4	5·7
19	4017	50	Bn	A+2	5·9
21	4019	B	D	E−6, A+1	6·0
26	4024	,,	Ma	B+1, C+5	6·6
27	4025	,,	D	A+1	6·0
31	4029	30	Bn	A+3	5·8
Sept					
2	4031	45	Bh	A+1	6·0
5	4034	B	D	A−3, B+3	6·4
7	4036	,,	Bn	F (5) v (2) A	6·0
9	4038	25	,,	F (2) v (1) A	5·9
10	4039	B	D	E−5, A+3	5·8
12	4041	,,	,,	E−4, A+3	5·8
12	4041	22	Ni	=F	5·5
14	4043	50	Bn	A+2	5·9
17	4046	B	,,	F (3) v (1) A	6·0
19	4048	,,	D	A−1, B+4	6·3
20	4049	,,	Wi	A−2, B+4	6·3
22	4051	,,	D	A−1, B+4	6·3
23	4052	,,	,,	A−2·5, B+3	6·4
23	4052	,,	Wi	A−4, B+2	6·5
23	4052	50	Bn	=A	6·1
26	4055	45	Bh	A−1	6·2
27	4056	50	Bn	A (1) v (3) B	6·3

July 2, 9, Sept. 12, Ni, Difficult.

(7754) W CYGNI—*continued.*

1924 Sept					
29	4058	B	D	A−4, B+1	6·6
Oct					
1	4060	,,	Ma	A (4) v (1) B, C+6	6·6
8	4067	25	Bn	A+1	6·0
12	4071	50	,,	A+1	6·0
12	4071	B	D	E−5, A+2	5·9
14	4073	,,	Bn	F (3) v (1) A	6·0
19	4078	,,	,,	F (3) v (1) A	6·0
22	4081	25	,,	F (2) v (1) A, A+1·5	5·9
23	4082	B	D	A−3, B+4	6·4*b*
24	4083	,,	,,	A−3, B+2	6·5
24	4083	22	Ni	A+0·5	6·1
26	4085	34	Li	F (4) v (6) A	5·8
27	4086	45	Bh	=X	6·5
Nov					
3	4093	50	Bn	A+1	6·0
3	4093	45	Bh	=X	6·5
3	4093	34	Li	F (3) v (7) A	5·7
3	4093	31	D	=A	6·1
4	4094	B	,,	A−1, B+4	6·3
4	4094	22	Ni	A+1	6·0
8	4098	F	D	E−5, A+2	5·9
8	4098	,,	Li	F (5) v (5) A	5·8
10	4100	50	Bn	A (1) v (4) B	6·2
14	4104	B	D	A−5, B+1	6·6*b*
1924 Nov					
17	4107	F	Li	F (6) v (4) A, =C	5·9
23	4113	22	Ni	=A	6·1
27	4117	50	Bn	A+1	6·0
30	4120	B	D	A−5, B+1	6·6
Dec					
3	4123	F	Li	F (7) v (3) A	5·9
5	4125	50	Bn	A+1	6·0
5	4125	22	Ni	A (5) v (1·5) B	6·6
6	4126	B	D	A−3, B+3	6·4
6	4126	F	Li	F (8) v (2) A	6·0
9	4129	50	Bn	F (5) v (2) A, A+2	5·9
9	4129	34	Li	F (8) v (2) A	6·0
13	4133	,,	,,	F (8) v (2) A	6·0
14	4134	25	Bn	A (1) v (3) B, A−1	6·3
22	4142	22	Ni	A (3) v (3) B	6·4
23	4143	B	D	A−4, B+2	6·5
24	4144	25	Bn	A (1) v (4) B, A−1	6·2
25	4145	B	D	A−4, B+1	6·6
26	4146	45	Bh	=A	6·1
26	4146	25	Bn	A (1) v (3) B	6·3
28	4148	B	D	=B	6·7
29	4149	,,	,,	=K	6·8
30	4150	,,	,,	B+1	6·6
30	4150	50	Bn	A−1	6·2
30	4150	45	Bh	A−1	6·2
31	4151	22	Ni	F (2·5) v (5) A	5·7

Oct. 23, Difficult.
Oct. 26, 6e, With B, 0·3.
Nov. 3, Li, With B, 5·7.

Dec. 13, With B, 6·2. Ni remarks for the year's obs. :—"A very difficult star."

(5955) R DRACONIS. (V. 1.)

H.D. 163266.

Date.	Julian Date.	Inst.	Observer.	Comparisons.	Deduced Mag.
1920 Jan					
1	2325	240	Br	27 3	12·3
1	2325	120	Bn	27 2	12·2
8	2332	75	Bg	27 2	12·2*b*
11	2335	94	Ni	27 (2) v (3) 32	12·2*b*
13	2337	160	Br	22 2, 27+1	11·9
14	2338	55	Bo	24	11·9
17	2341	80	AB	20−4	11·7*b*
19	2343	85	Bn	22 (2) v (3) 27	11·8
21	2345	120	,,	22 (1) v (2) 27	11·7
21	2345	60	D	22 2	11·8*b*
21	2345	55	Bo	19 (3) v (1) 20	11·2
22	2346	80	AB	20 4, 27+2·5	11·7
23	2347	94	Ni	22 (4) v (2) 27	11·9
24	2348	120	Bn	22 (1) v (3) 27	11·7
24	2348	75	Bg	19 3, 20	11·3
26	2350	55	Bo	20 (3) v (1) 22	11·5
26	2350	100	Br	20 2, 22+2	11·4
31	2355	120	Bn	20 (1) v (1) 22	11·4
31	2355	75	Bg	19 1, 20+2	11·1*b*
1920 Feb					
1	2356	55	Bo	19 (1) v (1) 20	11·1
3	2358	94	Ni	19 (2) v (2) 20	11·1
5	2360	80	AB	19−5, 22+3	11·4
6	2361	55	Bo	18 (1) v (1) 19	10·8
7	2362	80	AB	19−5, 22+5	11·3
7	2362	55	Bg	=19	11·0
7	2362	160	Br	18−2, 19+2	10·8
7	2362	94	Ni	19 (3) v (3) 20	11·1
8	2363	120	Bn	18 (4) v (1) 19	10·9
11	2366	55	Bo	18 (1) v (1) 19	10·8
13	2368	80	AB	18 4, 19+3	10·8
14	2369	55	Bg	18−1, 19+3	10·7
15	2370	,,	Bo	17 (3) v (1) 18	10·5
16	2371	60	D	16−3, 18+1	10·5
17	2372	94	Ni	18 (1) v (5) 19	10·6
17	2372	40	Hw	=16	10·2*b*
17	2372	120	Bn	18 (1) v (4) 19	10·6
18	2373	80	AB	16−4, =18	10·6
18	2373	30	D	16−1, 18+3	10·3
19	2374	55	Bg	16−2, 18+2	10·4
19	2374	,,	Bo	17 (1) v (3) 18	10·5
21	2376	45	Br	16+1	10·1
22	2377	55	Bo	13 (4) v (1) 16	10·1

Jan. 1, Bn, t.
Jan. 21, D, Difficult.

(5955) R DRACONIS—*continued.*

1920					
Feb					
23	2378	55	Bg	12−6, 16+2	10·0
23	2378	30	D	16−1, 18+4	10·2
23	2378	22	Ni	13 (4) v (1) 16	10·1
27	2382	23	Bo	12 (1) v (3) 13	9·5
29	2384	80	AB	12−2, 16+3	9·7
Mar					
2	2386	50	Bn	9 (3) v (2) 12	9·3
3	2387	55	Bo	8 (2) v (1) 9	9·0
3	2387	80	AB	12−1, 16+5·5	9·6*b*
6	2390	,,	,,	9−1, 12+3·5	9·1*c*
7	2391	45	Br	9+3	8·8
7	2391	50	Bn	6 (2) v (1) 9	8·9
8	2392	23	Bo	7 (1) v (1) 8	8·7
8	2392	60	Co	=8, 9+2	8·9
11	2395	,,	,,	=7, 9+3	8·6
11	2395	25	AB	4−3	8·6*b*
12	2396	23	Bo	3 (1) v (3) 4	8·1
12	2396	55	Bg	7−1, 8+2·5	8·6
12	2396	50	Bn	4 (3) v (1) 6	8·5
12	2396	30	D	=4, 6+3	8·3*b*
12	2396	40	Hw	4 (2) v (8) 9	8·4
15	2399	30	D	2 (4) v (1) 4, 4+3	8·1*b*
16	2400	25	AB	4+1	8·2*c*
16	2400	23	Bo	3 (1) v (1) 4	8·2
17	2401	60	Co	=4	8·3*b*
18	2402	,,	,,	4+1	8·2
18	2402	22	Ni	3+1	7·9
18	2402	30	Bn	3 (5) v (2) 4	8·2
18	2402	160	Br	=4	8·3
19	2403	23	Bo	2 (7) v (1) 3	7·9
19	2403	30	D	2 (3) v (2) 4, 4+4	7·9
19	2403	25	AB	=3, 4+2	8·1
20	2404	,,	,,	=3, 4+3	8·0
20	2404	30	Bg	=3, 4+2	8·1
20	2404	,,	Bn	3 (3) v (2) 4	8·2
20	2404	60	Co	4+3	8·0
21	2405	25	AB	3+1, 4+4	7·9
22	2406	40	Hw	=4	8·3
23	2407	30	Bg	2−4, 3+2	7·8
26	2410	25	AB	d−2·5, 3+2·5	7·8
30	2414	23	Bo	=2	7·4
30	2414	30	Co	2−3, 4+6	7·7
31	2415	25	Bn	2 (1) v (5) 3	7·5
31	2415	30	Bg	2−2, 3+4	7·6*b*
Apr					
5	2420	22	Ni	2+3	7·1
5	2420	30	Co	=2	7·4
6	2421	,,	D	1−3·5, 2+1·5	7·3*b*
6	2421	F	AB	b−2, d+3	7·4
6	2421	23	Bo	1 (3) v (1) 2	7·3
7	2422	F	AB	=b	7·2
10	2425	22	Ni	1 (5) v (1·5) 2	7·3
11	2426	F	AB	b+1	7·1
12	2427	30	Bn	2+2	7·2
12	2427	,,	Co	2+2	7·2
13	2428	,,	D	1−2, 2+2	7·2
15	2430	23	Bo	1 (3) v (1) 2	7·3
15	2430	30	Co	1−3, 2+2	7·2
16	2431	,,	,,	2+1	7·3
16	2431	F	Bg	1−4, 2+1	7·3*b*
19	2434	45	Br	1−2, 2+4	7·1
20	2435	F	AB	1−4, 2+1	7·3
20	2435	22	Ni	1 (7·5) v (2·5) 2	7·3
21	2436	30	Co	=2	7·4
21	2436	,,	D	1−3, 2+2	7·2
1920					
Apr					
21	2436	30	Bn	1 (4) v (1) 2	7·3
21	2436	,,	Bg	1−4, 2+2	7·3
21	2436	45	Br	1−3, 2+3	7·2
22	2437	B	AB	1−4·5, 2+2	7·3
23	2438	30	Co	=2	7·4
23	2438	,,	D	1−3, 2+2	7·2
24	2439	F	AB	1−4·5, 2+1	7·3*b*
25	2440	30	Co	=2	7·4
27	2442	,,	Bn	1 (4) v (1) 2	7·3
29	2444	,,	,,	1 (4) v (1) 2	7·3
29	2444	F	AB	b−1, 2+3	7·2*c*
30	2445	,,	,,	b−2, d+3	7·4*b*
May					
2	2447	30	Bg	1−4, 2+2	7·3*b*
3	2448	,,	Bn	2+0·5	7·4
5	2450	F	AB	d+1	7·6*b*
7	2452	,,	,,	d−1, 3+5	7·7
7	2452	45	Br	2−2	7·6
7	2452	30	Bn	2 (2) v (1) 3	7·8
7	2452	,,	D	2−5, 4+4	7·9
9	2454	22	Ni	2 (7·5) v (2·5) 3	7·9
9	2454	30	Bn	3+2	7·8
9	2454	F	AB	d−2, 4+6	7·8
10	2455	55	Bg	2−5, 3+1	7·9
12	2457	30	D	2−5·5, 4+3·5	8·0
13	2458	,,	Bn	3+1·5	7·9
14	2459	50	Ma	4+4	7·9
15	2460	25	AB	4+5	7·8*c*
16	2461	F	,,	d−4·5, 4+5·5	7·9*b*
19	2464	55	Bg	3−1, 4+1·5	8·1
19	2464	30	Bn	=3	8·0
19	2464	50	Ma	4+3	8·0
21	2466	30	D	=4	8·3*b*
21	2466	22	Ni	3 (5) v (1·5) 4	8·2
22	2467	50	Ma	4+5	7·8
23	2468	120	Br	4+1	8·2
23	2468	30	Bn	3 (4) v (1) 4	8·2
26	2471	55	Bg	=4	8·3*b*
26	2471	25	AB	4−2, =7	8·5*b*
29	2474	50	Bn	4 (1) v (1) 6	8·4
30	2475	25	AB	4−5, 9+5·5	8·6*b*
June					
1	2477	55	Bg	4−2, =7	8·5
1	2477	50	Bn	4 (4) v (1) 6	8·5
3	2479	,,	Ma	4 (3) v (1) 12	9·1
6	2482	,,	Bn	6 (2) v (1) 9	8·9
6	2482	25	AB	9−2, 12+3	9·2*b*
8	2484	22	Ni	9+1	9·0
8	2484	30	D	9−1, 12+2	9·2
8	2484	45	Br	=9	9·1
9	2485	50	Bn	9 (3) v (2) 12	9·3
10	2486	30	D	9−3, 12+1	9·3*b*
14	2490	50	Ma	18+1·5	10·4
15	2491	30	D	12−5, 16+4	9·8*b*
19	2495	160	Br	=16	10·2
19	2495	50	Bn	14 (1) v (1) 16	10·0
20	2496	25	AB	16−1, 18+2	10·3
22	2498	50	Ma	16 (2) v (1) 18	10·4
22	2498	80	AB	16−1, 18+3	10·3
23	2499	55	Bg	16−2, 18+2	10·4
29	2505	160	Br	=19	11·0
July					
3	2509	55	Bg	18−2, 19+2	10·8
9	2515	60	D	=20	11·3*b*

Mar. 6, With 25, 9·1.

May 19, 22, Ma, Pale yellow.
July 9, D, About. Difficult.

(5955) R DRACONIS—*continued.*

1920					
July					
9	2515	94	Ni	=20	11·3
11	2517	80	AB	19−2·5	11·2*c*
13	2519	75	Bg	19−2, 20+1	11·2
14	2520	80	AB	19+1	11·9*b*
15	2521	120	Bn	19 (2) v (1) 20	11·2
16	2522	94	Ni	20 (1) v (3) 22	11·3
17	2523	160	Br	=20	11·3
19	2525	120	Bn	20 (1) v (2) 22	11·4
19	2525	60	D	<20	<11·3*c*
24	2530	120	Bn	20 (4) v (1) 22	11·5
24	2530	79	Ma	=27	12·0
24	2530	94	Ni	22 (2) v (2) 27	11·8*b*
28	2534	183	Ma	27+1	11·9
30	2536	120	Br	22−2, 27+1	11·9
Aug					
4	2541	94	Ni	22 (5) v (1) 27	11·9*b*
5	2542	183	Ma	=27	12·0
9	2546	120	Bn	27−3	12·3*b*
9	2546	183	Ma	27 (1) v (1) u	12·4
15	2552	,,	,,	27 (3) v (1) u	12·6
17	2554	160	Bo	32 (1) v (1) 33	12·7
19	2556	,,	Br	27−3, 32−1	12·5
22	2559	183	Ma	u+3	12·5*b*
26	2563	75	Bg	22−3, 27+1	11·9
Sept					
4	2572	183	Ma	27 (3) v (1) u, u+3·5	12·6
6	2574	80	AB	<(27−3)	<12·3
8	2576	160	Bo	32 (3) v (1) 33	12·8
9	2577	94	Ni	=32	12·5*b*
10	2578	160	Br	32−2	12·7
12	2580	120	Bn	27−4	12·4*b*
14	2582	94	Ni	27 (4) v (1) 32	12·4
14	2582	130	Bo	32 (3) v (1) 33	12·8
16	2584	120	Bn	32−1	12·6*b*
18	2586	95	,,	32−1	12·6
18	2586	183	Ma	27−5	12·5
19	2587	160	Bo	32 (1) v (1) 33	12·7
19	2587	75	Bg	27−4, 32+1	12·4
19	2587	80	AB	<(27−3)	<12·3
20	2588	94	Ni	27 (3) v (3) 32	12·3
25	2593	160	Br	27−1	12·1*b*
29	2597	183	Ma	=27	12·0
Oct					
2	2600	120	Bn	22 (3) v (1) 27	11·9
3	2601	160	Bo	22 (4) v (1) 27	11·9
6	2604	120	Bn	22 (1) v (1) 27	11·8
6	2604	183	Ma	20−2, 27+2	11·6
6	2604	94	Ni	22 (1·5) v (4) 27	11·7
9	2607	55	Bo	22 (1) v (1) 24	11·8
11	2609	94	Ni	20 (1·5) v (1·5) 22	11·4
11	2609	120	Bn	20 (3) v (1) 22	11·5
12	2610	60	Co	19−1	11·1*c*
13	2611	50	Ma	20+1	11·2
14	2612	55	Bo	19 (3) v (1) 20	11·2
15	2613	80	AB	19−5, 20+1, 27+3	11·4
18	2616	160	Br	19−1, 20+2	11·1
1920					
Oct					
18	2616	120	Bn	20 (1) v (3) 22	11·3
18	2616	94	Ni	19 (3) v (3) 20	11·1
19	2617	60	Co	=19	11·0
19	2617	40	Hw	19 (5) 20 (5) v	11·6
19	2617	75	Bg	19−1, 20+2	11·1
19	2617	130	Bo	17 (3) v (1) 18	10·5
22	2620	80	AB	20−0·5	11·3
23	2621	79	Ma	19+1	10·9
23	2621	120	Bn	19 (2) v (1) 20	11·2
25	2623	55	Bo	17 (1) v (1) 18	10·5
25	2623	60	Co	18−1	10·7
25	2623	79	Ma	18 (1) v (2) 19	10·7
25	2623	60	Ms	18−0·5	10·6
28	2626	94	Ni	18 (5) v (3) 19	10·8
28	2626	60	Ms	18+1	10·5
28	2626	90	Hw	=19	11·0
29	2627	80	AB	18−3, 19+3	10·8
29	2627	75	Bg	18−1, 19+3	10·7
29	2627	120	Bn	18 (1) v (3) 19	10·7
29	2627	60	Co	=17, 18+2	10·4
30	2628	,,	Ms	17+1, 18+2	10·4
30	2628	,,	Co	16−4, =17, 18+2	10·5
30	2628	160	Br	16−1, 18+3	10·3
30	2628	55	Bo	12 (7) v (1) 16	10·1
31	2629	80	AB	=18	10·6
Nov					
1	2630	79	Ma	16+1, 18+2·5	10·2
1	2630	94	Ni	13 (6) v (1) 16	10·1
1	2630	120	Bn	18+0·5	10·5
4	2633	50	,,	14 (1) v (1) 16	10·0
4	2633	55	Bo	13 (1) v (3) 16	9·8
4	2633	80	AB	16−2, 18+3	10·3
5	2634	60	Ms	12−4	9·8
5	2634	,,	Co	=16, 17+3	10·2
6	2635	80	AB	12−3, 16+3	9·8
7	2636	60	Co	16+2	10·0
7	2636	,,	Ms	12−4	9·8
8	2637	55	Bo	8 (3) v (1) 9	9·0
9	2638	60	Co	12−1·5	9·6
9	2638	,,	Ms	12−1	9·5
10	2639	,,	Co	12−1	9·5
10	2639	80	AB	12−1	9·5
11	2640	50	Bn	9 (2) v (1) 12	9·5
11	2640	,,	Ma	9+1	9·0
12	2641	55	Bg	=8, 9+2	8·6
12	2641	90	Hw	=12	9·4
13	2642	,,	,,	9 (6) v (4) 12	9·3
13	2642	80	AB	9−1, 12+4	9·1
13	2642	60	Co	9−1, 12+2	9·2
15	2644	160	Br	4−4, 9+4	8·7
15	2644	50	Bn	6 (2) v (1) 9	8·9
15	2644	60	Co	9−1, 12+2	9·2
15	2644	,,	Ms	9−1, 12+3	9·1
16	2645	55	Bg	7−2, 8+1	8·7
16	2645	,,	Bo	5 (3) v (1) 6	8·5
17	2646	25	AB	9+1	9·0
18	2647	,,	,,	8−3, 9+3	8·8
18	2647	94	Ni	4 (5) v (5) 9	8·7
18	2647	79	Ma	4 (3) v (2) 12	9·0

On all these occasions u (H.C.O. mag. 13·8) estimated by Ma as =12·8 mag.
July 19, D, Glimpsed.
Aug. 9, Bn, t. Just seen.
Sept. 6, Not seen.
Sept. 9, Very difficult.
Sept. 10, About.
Sept. 12, t.
Sept. 19, AB, Not seen.
Sept. 25, Difficult.

Oct. 31, With 25, 10·6.
Nov. 1, Ni, With 22, 10·0.
Nov. 4, AB, With 25, 10·3.
Nov. 6, With 25, 9·8.
Nov. 10, AB, With 25, 9·5.
Nov. 13, AB, With 25, 9·1.
Nov. 18, Ni, With 22, 8·7.

(5955) R DRACONIS—*continued.*

1920 Nov					
18	2647	60	Ms	7−1, 9+3	8·7
19	2648	,,	,,	4−3, =7	8·6
19	2648	,,	Co	4−3, =7	8·6
19	2648	55	Bg	7−1, 8+2	8·6
20	2649	,,	Bo	=4	8·3
20	2649	50	Bn	6 (2) v (3) 9	8·7
20	2649	90	Hw	4 (5) v (5) 9	8·7
21	2650	79	Ma	4 (1) v (2) 9	8·5
22	2651	25	AB	4−1	8·4
23	2652	50	Bn	4 (1) v (3) 6	8·3
24	2653	60	Co	=4, 7+2	8·3
24	2653	,,	Ms	=4	8·3
Dec					
1	2660	25	AB	4−1, g+2	8·4
1	2660	55	Bg	3−1, 4+2	8·1
1	2660	160	Br	4+2	8·1
1	2660	50	Bn	4−1	8·4
1	2660	60	Co	4+3	8·0
3	2662	50	Ma	4+3	8·0
4	2663	94	Ni	=4	8·3
5	2664	60	Co	4+3	8·0
9	2668	,,	,,	3−2, 4+2	8·2
9	2668	79	Ma	4+2·5	8·0
9	2668	50	Bn	4+2	8·1
10	2669	60	Ms	4+3, 7+6	8·0
10	2669	,,	Co	4+2	8·1
12	2671	50	Bn	3 (1) v (2) 4	8·1
12	2671	55	Bo	3 (1) v (1) 4	8·2
14	2673	60	Co	4+3	8·0
16	2675	79	Ma	4+2	8·1
17	2676	80	AB	4−0·5	8·3*b*
20	2679	,,	,,	4−1	8·4*b*
20	2679	55	Bg	=4	8·3*b*
21	2680	90	Hw	=4	8·3*b*
21	2680	30	Bn	3 (1) v (1) 4	8·2
22	2681	80	Co	4−1, 7+2	8·4
22	2681	60	Ms	4−2, =7	8·5
22	2681	55	Bg	4−1, 7+1·5	8·4
22	2681	,,	Bo	=4	8·3
26	2685	80	Co	4−1, 7+2	8·4
28	2687	,,	,,	4−1, 7+1	8·4
28	2687	60	Ms	4−5, 9+3	8·8
28	2687	90	Hw	4 (5) v (5) 9	8·7
28	2687	30	Bn	4 (1) v (3) 6	8·3
28	2687	55	Bg	7−1·5, 8+2	8·7
30	2689	80	AB	4−3, =g	8·6*c*
31	2690	45	Br	=4	8·3
1921 Jan					
1	2691	25	AB	g−2, 9+4	8·7
2	2692	80	Co	4−1·5, =7	8·5
5	2695	,,	,,	4−2, =7	8·5
6	2696	25	AB	g−3, 9+3	8·8
9	2699	22	Ni	4 (4) v (0·5) 9	9·0
9	2699	60	Ms	4−5, 9+2	8·8

Nov. 24, Co, Doubtful.
Dec. 1, 10, Co, Yellowish white.
Dec. 3, Reddish.
Dec. 4, With 22, 8·2.
Dec. 9, Co, White. Ma, Slight touch of red. Bn, With 30, 8·0.
Dec. 17, With 25, 8·3.
Dec. 20, AB, With 25, 8·4.
Dec. 22, 28, Ms, t.
Dec. 30, With 25, 8·6.
Jan. 9, Ms, t.

1921 Jan					
10	2700	60	Ms	4−4, 9+3	8·7
10	2700	80	Co	4−4, 8+1	8·7
10	2700	30	Bn	6 (2) v (1) 9	8·9*b*
12	2702	,,	,,	6 (5) v (2) 9	8·9
12	2702	80	Co	=8, 9+1, 12+4	8·9
13	2703	25	AB	=9, 12+3	9·1
14	2704	55	Bo	7 (1) v (3) 8	8·6
15	2705	45	Br	4−3	8·6*b*
15	2705	80	Co	=9, 12+3	9·1
16	2706	25	AB	9−3, 12+1	9·3
16	2706	40	Hw	=9	9·1*b*
16	2706	22	Ni	=9	9·1
16	2706	30	D	6−4, 9+2	8·9
17	2707	60	Ms	4−6, 9+1	8·9
18	2708	80	Co	9−2, 12+1	9·3
19	2709	60	Ms	9−1, 12+2	9·2
22	2712	80	Co	=12	9·4
22	2712	60	Ms	12−2	9·6*b*
27	2717	55	Bo	9 (4) v (1) 12	9·3
28	2718	50	Bn	9 (3) v (1) 12	9·3*b*
28	2718	60	Co	12−3, 16+1	9·9
29	2719	25	AB	12−5, 16+3	9·9
31	2721	80	,,	16+2	10·0*b*
31	2721	55	Bo	9 (3) v (1) 12	9·3*b*
31	2721	,,	Bg	13−4, 16+1·5	10·0
Feb					
1	2722	50	Bn	12 (1) v (1) 14	9·6
2	2723	40	Hw	=12	9·4*b*
2	2723	60	Co	12−4, 16+1	9·9
3	2724	,,	,,	=16	10·2
3	2724	80	AB	16−2, 18+4	10·3
3	2724	160	Br	16+2	10·0
5	2726	55	Bo	16 (1) v (3) 17	10·2
9	2730	60	Co	=17	10·5
12	2733	80	AB	18−3, 19+2	10·8*b*
14	2735	120	Bn	18 (2) v (1) 19	10·8
15	2736	80	AB	18−4, 19+2	10·9*c*
16	2737	94	Ni	18 (5) v (1) 19	10·9
17	2738	160	Br	18−1	10·7
19	2740	,,	Bo	18 (3) v (1) 19	10·9
20	2741	94	Ni	19 (2) v (3) 20	11·1
23	2744	80	AB	19−1	11·1*b*
24	2745	40	Hw	18 (5) v (5) 19	10·8*b*
24	2745	120	Bn	19 (2) v (1) 20	11·2
24	2745	55	Bg	18−2, 19+2	10·8
24	2745	160	Bo	19 (3) v (1) 20	11·2
25	2746	60	Ms	18−3	10·9
25	2746	,,	Co	=19	11·0
Mar					
1	2750	120	Bn	20 (1) v (1) 22	11·4
1	2750	40	Hw	=19	11·0*b*
2	2751	94	Ni	20 (1) v (2) 22	11·4
2	2751	60	Co	=20	11·3*c*
2	2751	75	Bg	19−1, 20+2	11·1
2	2751	55	Bo	19 (1) v (2) 20	11·1
2	2751	60	Ms	20+1	11·2
3	2752	80	AB	19−4, 20+1	11·3
4	2753	,,	Ca	=19	11·0
7	2756	40	Hw	=20	11·3*b*
8	2757	160	Bo	20 (3) v (1) 22	11·5
10	2759	55	,,	20 (1) v (3) 21	11·3
10	2759	160	Br	20−2, 22+2	11·4
10	2759	120	Bn	20 (2) v (1) 22	11·5
12	2761	94	Ni	22 (3) v (3) 27	11·8

Jan. 10, 17, Ms, t.
Jan. 28, Co, Doubtful.

(5955) R DRACONIS—*continued.*

1921					
Mar					
15	2764	55	Bo	21 (3) v (1) 24	11·8
18	2767	75	Bg	20−1, 22+2	11·4
18	2767	120	Bn	22 (3) v (2) 27	11·8
20	2769	160	Br	22−1, 27+2	11·8
25	2774	120	Bn	22−3, 27+2	11·9
29	2778	94	Ni	27 (3) v (3) 32	12·3*b*
30	2779	160	Bo	24 (4) v (1) 27	12·0
30	2779	75	Bg	22−3, 27+1	11·9
30	2779	120	Bn	27+1	11·9
Apr					
1	2781	80	AB	27−3	12·3*c*
2	2782	55	Bo	26 (1) v (1) 28	12·2
2	2782	120	Br	=27	12·0
4	2784	85	Bn	27+1	11·9*b*
7	2787	120	,,	27−1	12·1
7	2787	160	Bo	=27	12·0
7	2787	75	Bg	=27	12·0
8	2788	94	Ni	27 (4) v (1·5) 32	12·4
12	2792	160	Bo	=27	12·0
15	2795	120	Br	27−3, 32+1	12·4
18	2798	160	Bo	27−2	12·2
27	2807	94	Ni	=32	12·5
27	2807	120	Bn	27 (1) v (3) 32	12·1
28	2808	225	Bo	27 (1) v (3) 29	12·1
28	2808	75	Bg	=22	11·6
28	2808	80	AB	27−2	12·2
29	2809	160	Br	27−1	12·1
29	2809	120	Bn	27 (1) v (3) 32	12·1
May					
3	2813	94	Ni	27 (3) v (1) 32	12·4
6	2816	80	AB	< (27−1)	<12·1
8	2818	75	Bg	20−2, 22+1	11·5
8	2818	120	Bn	22 (4) v (1) 27	11·9
10	2820	160	Bo	24 (1) v (1) 27	12·0
12	2822	94	Ni	27 (2·5) v (2·5) 32	12·3
19	2829	120	Bn	20−5, 22−1	11·7*b*
19	2829	55	Bg	=20	11·3
20	2830	,,	Bo	20 (2) v (1) 23	11·6
22	2832	120	Bn	20 (3) v (1) 22	11·5
23	2833	79	Ma	=20	11·3*b*
24	2834	120	Bn	20 (1) v (3) 22	11·3
28	2838	55	Bg	=19	11·0
29	2839	60	D	=19, 20+5	10·9
31	2841	,,	,,	19−2, 20+3	11·1
31	2841	80	AB	19−2, 20+4	11·0
June					
1	2842	94	Ni	18 (3) v (3) 19	10·8*b*
1	2842	55	Bo	18 (1) v (2) 19	10·7
2	2843	75	Bg	18−2, 19+2	10·8*b*
5	2846	60	D	18−3, 19+2	10·8
6	2847	160	Br	=18	10·6
6	2847	50	Bn	16 (2) v (1) 18	10·4
9	2850	55	Bg	16−2, 18+2	10·4
10	2851	80	AB	16−2, 18+3	10·3
11	2852	50	Bn	14 (4) v (1) 16	10·1
14	2855	55	Bo	12 (1) v (3) 13	9·5
15	2856	75	Bg	12−2, 16+6	9·6
15	2856	50	Bn	12 (2) v (1) 14	9·7
16	2857	30	D	12−1, 16+6	9·5*b*
22	2863	55	Bg	9−1, 12+3	9·1
23	2864	50	Bn	9+1	9·0
24	2865	80	AB	9−3, 12+2	9·3
24	2865	30	D	6−4, 9+3	8·8*b*

Apr. 27, Bn, t.
May 6, Not seen.
May 23, ±.

1921					
June					
24	2865	22	Ni	4 (7·5) v (0·5) 9	9·0
27	2868	60	D	6−3·5, 9+3	8·8
27	2868	55	Bg	7−2·5, 8+1	8·8
28	2869	50	Bn	6 (1) v (1) 9	8·8
29	2870	45	Br	4−4, 9+4	8·7
July					
2	2873	55	Bg	4−2, =7	8·5
4	2875	30	D	4−1, 6+2	8·4
4	2875	22	Ni	4 (4) v (3) 9	8·7
5	2876	30	Bn	4 (2) v (1) 6	8·4
5	2876	32	Ca	4−1, g+2	8·4
7	2878	55	Bg	3−1·5, 4+1	8·2
8	2879	75	Bn	3 (1) v (2) 4	8·1
8	2879	30	D	4+2	8·1
9	2880	22	Ni	4 (2) v (5) 9	8·5
9	2880	80	AB	4+1	8·2
10	2881	50	Ma	4+0·5	8·2
10	2881	30	Bg	3−1, 4+2	8·1
11	2882	,,	D	2 (3) v (1) 4, 4+3	8·0
11	2882	80	AB	=3, 4+2	8·1
12	2883	30	Bn	3+2	7·8
13	2884	,,	D	2−6, 4+3	8·0
19	2890	,,	,,	2 (1) v (3) 4, 2−3	7·7
20	2891	,,	Bn	2 (1) v (1) 3	7·7
21	2892	,,	Bg	=2	7·4
21	2892	,,	D	2−1	7·5
22	2893	25	AB	1−3, 2+1	7·3
23	2894	32	Ca	1−2, b+1	7·1
25	2896	30	Bn	1 (2) v (1) 2	7·3
25	2896	,,	D	1−3, 2+2	7·2
25	2896	25	AB	1−3, 2+2	7·2
27	2898	F	,,	1−3, 2+3	7·2
28	2899	30	D	1−2, 2+4	7·1
29	2900	B	AB	1−3, 2+2	7·2
30	2901	30	D	1−3, 2+3	7·2
30	2901	80	Co	2+1	7·3
31	2902	,,	,,	1−3, 2+2	7·2
31	2902	B	AB	=2, d+3	7·4
31	2902	30	Bg	1−1, 2+4	7·0
Aug					
1	2903	B	AB	2−1, d+2	7·5
1	2903	30	D	1−2, 2+3	7·1
2	2904	80	Co	1−4, 2+1	7·3
3	2905	,,	,,	1−3, 2+2	7·2
3	2905	30	D	1−2, 2+2	7·2
4	2906	B	AB	2−2, d+3	7·5
4	2906	32	Ca	1+1	6·8
6	2908	30	D	1−2, 2+3	7·1
6	2908	80	Co	1−3, 2+1	7·1
6	2908	B	AB	2−2	7·0
6	2908	30	Bg	1−1, 2+4	7·0
7	2909	50	Ma	1−2·5, =2	7·1
8	2910	30	D	1−2, 2+3	7·1
8	2910	,,	Bn	1 (4) v (1) 2	7·1
8	2910	45	Br	=2	7·1
8	2910	80	Co	=2	7·1
9	2911	,,	,,	1−3, 2+1	7·1
11	2913	30	D	1−4, 2+2	7·1

July 10, Ma, White.
July 30, Co, White.
July 31, Co, White with yellow tinge.
Aug. 2, White, yellow tinge.
Aug. 3, Co, Yellowish white.
Aug. 7, Pale orange.
Aug. 8, Co, Yellow.

(5955) R DRACONIS—*continued.*

1921					
Aug					
13	2915	50	Ma	=2	7·4
14	2916	80	Co	=2	7·4
15	2917	,,	,,	2−0·5	7·5
18	2920	,,	,,	2−1	7·5
18	2920	30	D	1−4, 2+1	7·3*b*
18	2920	22	Ni	1 (8) v (2) 2	7·3
18	2920	30	Bg	1−4, 2+1	7·3
18	2920	55	Bo	1 (3) v (1) 2	7·3
19	2921	80	Co	2−2	7·6
21	2923	,,	,,	2−2	7·6
23	2925	30	D	=2	7·4*b*
23	2925	55	Bo	2 (1) v (3) 3	7·6
25	2927	30	Bn	2+1	7·3*b*
25	2927	50	Ma	=2	7·4
25	2927	80	Co	2−2·5	7·7
26	2928	30	D	2−2, 4+8	7·6*b*
26	2928	22	Ni	2 (6) v (6) 3	7·7*b*
27	2929	25	AB	d−4, 4+5	7·9*b*
28	2930	30	D	2−3, 4+6	7·7
28	2930	22	Ni	2 (7) v (4) 3	7·8
28	2930	80	Co	2−3·5, 4+4	7·8
29	2931	50	Ma	=2	7·4
30	2932	55	Bo	2 (1) v (1) 3	7·7
30	2932	45	Br	2−3, 4+5	7·8
30	2932	25	AB	4+5	7·8*b*
30	2932	80	Co	2−3, 4+4	7·8
31	2933	30	D	2 (2) v (3) 4, 2−5	7·8*b*
Sept					
2	2935	,,	,,	2−5, 4+4	7·9
2	2935	,,	Bn	3+2	7·8
2	2935	80	Co	2−4, 4+3	7·9
3	2936	50	Ma	4+5	7·8
4	2937	55	Bo	2 (5) v (3) 4	8·0
4	2937	80	Co	4+2·5	8·0
5	2938	,,	,,	4+1	8·2
5	2938	30	Bn	3+2	7·8
6	2939	,,	D	2 (4) v (1) 4, 4+3	8·1
6	2939	22	Ni	3+0·5	8·0
7	2940	55	Bg	3−1, 4+2	8·1
7	2940	30	Bn	3+2	7·8
7	2940	80	Co	4+1, 6+4	8·2
8	2941	,,	,,	4+2	8·1
8	2941	32	Ca	d−5, 4+1	8·2
8	2941	40	Hw	v (5) 4 (5) 9	7·5
9	2942	30	Bn	3+2	7·8
9	2942	80	Co	4+1	8·2
10	2943	45	Br	4+4	7·9
12	2945	80	Co	=4, 6+3	8·3
14	2947	,,	,,	=4, 6+2·5	8·3
14	2947	30	D	4+1	8·2
15	2948	,,	Bn	=3	8·0
16	2949	80	Co	=4, 6+3	8·3
21	2954	55	Bo	4 (1) v (2) 6	8·4
21	2954	,,	Bg	=4	8·3
21	2954	50	Bn	=4	8·3
21	2954	40	Hw	4 (3) v (7) 9	8·5*b*
21	2954	30	D	4−2, 6+1	8·5*b*
23	2956	22	Ni	4 (5) v (2) 9	8·8

Aug. 13, ±.
Aug. 15, Yellowish white.
Aug. 25, Ma, ±.
Aug. 29, ±. Pale yellow.
Sept. 4, Co, Orange.
Sept. 8, Co, Deep red.
Sept. 16, Ruddy.

1921					
Sept					
24	2957	30	Bn	4 (2) v (1) 6	8·4
24	2957	45	Br	4−4, 9+4	8·7
25	2958	55	Bg	7−1·5, 8+2	8·7
25	2958	50	Ma	4 (1) v (1) 12	8·8
26	2959	55	Bo	7 (3) v (1) 8	8·8
27	2960	50	Bn	6 (1) v (3) 9	8·7
27	2960	40	Hw	4 (5) v (5) 9	8·7
28	2961	30	D	6−5, 9+2	8·9
29	2962	55	Bg	9−1, 12+2	9·2
29	2962	50	Bn	6 (3) v (1) 9	8·9
29	2962	22	Ni	9 (1·5) v (4) 13	9·2
Oct					
1	2964	55	Bo	8 (2) v (1) 9	9·0
1	2964	50	Bn	9 (1) v (2) 10	9·1
1	2964	80	Co	9−2, 12+1	9·3
4	2967	,,	,,	9−3, =12	9·4*b*
4	2967	50	Ma	12+1	9·3
4	2967	,,	Bn	12 (1) v (1) 14	9·6
5	2968	80	Co	12−1, 13+1	9·5
6	2969	,,	,,	12−1·5, =13	9·6
6	2969	50	Bn	12 (2) v (1) 14	9·7
6	2969	55	Bg	12−1, 16+6	9·5
6	2969	,,	Bo	9 (1) v (1) 12	9·2
8	2971	50	Bn	12 (4) v (1) 14	9·7
9	2972	22	Ni	13 (2) v (2) 16	9·9
9	2972	30	D	12−5, 16+3	9·9
9	2972	80	Co	12−3·5, 13−2	9·8
14	2977	160	Br	16+2	10·0
14	2977	50	Bn	16+1	10·1
14	2977	80	Co	=16	10·2*c*
15	2978	55	Bo	13 (3) v (2) 16	9·9
16	2979	,,	Bg	=16	10·2*b*
16	2979	120	Bn	16+1	10·1
18	2981	80	Co	16−2, =17	10·4*b*
21	2984	,,	,,	=18	10·6*c*
21	2984	55	Bo	18 (1) v (1) 19	10·8
23	2986	120	Bn	18 (3) v (2) 19	10·8
23	2986	50	Ma	16−1·5, 18−2	10·5
24	2987	80	Co	19+2	10·8*c*
25	2988	160	Br	19−1, 20+2	11·1
29	2992	,,	Bo	18 (3) v (2) 19	10·8
31	2994	48	Bg	=19	11·0*b*
31	2994	80	Ca	18−3, 19+1	10·9
Nov					
1	2995	120	Bn	18 (3) v (1) 19	10·9
6	3000	,,	,,	19 (3) v (1) 20	11·2
6	3000	140	Bo	19 (1) v (2) 20	11·1
6	3000	55	Bg	19−2, 20+1	11·2
7	3001	160	Br	=20	11·3
8	3002	94	Ni	19 (4) v (1) 20	11·2
10	3004	120	Bn	20 (1) v (3) 22	11·3
11	3005	55	Bo	19 (2) v (1) 20	11·2
19	3013	,,	,,	22 (1) v (2) 24	11·7*b*
22	3016	140	,,	24 (1) v (1) 27	12·0
22	3016	94	Ni	22 (2) v (2) 27	11·8
23	3017	55	Bg	22−2, 27+2	11·8
23	3017	120	Bn	22 (3) v (1) 27	11·9
25	3019	160	Bo	24 (1) v (1) 27	12·0
26	3020	94	Ni	22 (4) v (3) 27	11·8
29	3023	120	Br	27−2, 32+2	12·3
Dec.					
4	3028	94	Ni	27 (4) v (3) 32	12·3
4	3028	120	Bn	27−2	12·2
17	3041	140	Bo	31 (1) v (1) 32	12·5
20	3044	120	Bn	27−2	12·2
20	3044	75	Bg	=32	12·5
23	3047	120	Br	27−3	12·3
24	3048	94	Ni	27 (4) v (2) 32	12·4

(5955) R DRACONIS—*continued.*

1921 Dec					
26	3050	160	Bo	32 (1) v (1) 34	12·7
29	3053	75	Bg	=32	12·5
29	3053	85	Bn	27−1	12·1
29	3053	94	Ni	27 (5) v (2) 32	12·4
1922 Jan					
4	3059	160	Br	27−2, 32+1	12·3
16	3071	85	Bn	22 (4) v (1) 27	11·9
17	3072	160	Bo	22 (2) v (2) 27	11·8*c*
20	3075	75	Bg	22−3, 27+1	11·9
22	3077	120	Br	27−1	12·1
30	3085	140	Bo	19 (1) v (2) 20	11·1
Feb					
1	3087	75	Bg	19−2, 20+1	11·2
4	3090	94	Ni	20 (4) v (2) 22 (5) 27	11·5
5	3091	160	Bo	19 (1) v (2) 20	11·1
6	3092	60	D	<20	<11·3
8	3094	140	Bo	18 (2) v (2) 19	10·8*b*
9	3095	120	Bn	19 (2) v (1) 20	11·2
14	3100	140	Bo	18 (1) v (3) 19	10·7
17	3103	160	Br	=18	10·6
17	3103	120	Bn	18 (3) v (1) 19	10·9
18	3104	55	Bo	18 (1) v (3) 19	10·7
18	3104	,,	Bg	18−1, 19+3	10·7
18	3104	80	Co	18−3, 19+2	10·8*b*
24	3110	120	Bn	18+1	10·5
25	3111	55	Bo	16 (2) v (2) 18	10·4
25	3111	,,	Bg	12−6, 16+2	10·0*b*
25	3111	80	Co	=17	10·5*b*
25	3111	60	D	16−3, 18+2	10·4*b*
26	3112	32	Ca	16−2	10·4
26	3112	50	Bn	16−1, 18+2	10·3
27	3113	80	Co	=16	10·2*b*
Mar					
1	3115	,,	,,	16+2	10·0
2	3116	55	Bo	14 (3) v (1) 16	10·1
2	3116	50	Bn	14 (1) v (2) 16	9·9
4	3118	75	Bg	9−2, 12+1	9·3
4	3118	80	Co	12−3, 13+1·5	9·6
4	3118	30	D	12−2, 16+5	9·6*b*
7	3121	160	Br	=12	9·4
7	3121	50	Bn	9 (2) v (1) 12	9·3
9	3123	,,	,,	6−5, 9+1	9·0
10	3124	80	Co	9−1, 12+1·5	9·2
12	3126	50	Bn	6 (3) v (2) 9	8·8
14	3128	80	Co	7−2·5, 8+1	8·8
17	3131	30	D	4−3, 6+1	8·5*b*
17	3131	94	Ni	4 (5) v (5) 9	8·7
18	3132	55	Bo	4 (2) v (1) 7	8·4
18	3132	,,	Bg	4−1·5, 7+1	8·4
18	3132	32	Ca	=4	8·3
20	3134	50	Bn	4 (2) v (1) 6	8·4
20	3134	40	Hw	=4	8·3
20	3134	80	Co	4−0·5	8·3
23	3137	,,	,,	4+2	8·1
23	3137	55	Bo	=4	8·3
25	3139	160	Br	4+2	8·1
25	3139	50	Bn	3 (2) v (1) 4	8·2
28	3142	80	Co	4+4	7·9*b*
28	3142	50	Bn	3+1	7·9
29	3143	22	Ni	=4	8·3

Dec. 29, Bg, About.
Feb. 18, Mar. 28, Co, Difficult.
Mar. 4, D, Difficult.
Mar. 17, D, Difficult. Ni, With 22, 8·7.
Mar. 20, 23, Co, White.

1922 Mar					
30	3144	32	Ca	d−2, 3+1	7·9
31	3145	80	Co	2−2, 4+5	7·7
Apr					
1	3146	30	Bn	3 (1) v (2) 4	8·1
2	3147	80	Co	2−3	7·7
2	3147	30	Bg	=3, 4+3	8·0
4	3149	50	Bn	2 (3) v (1) 3	7·9
6	3151	80	Co	2−2	7·6
10	3155	,,	,,	2−3, 4+6	7·7
12	3157	32	Ca	d−1, 3+2	7·8
14	3159	22	Ni	2 (4) v (4) 3	7·7
16	3161	F	Bo	2 (4) v (2) 3	7·8
17	3162	80	Co	2−3, 4+6	7·7
19	3164	40	Hw	1 (7) v (3) 4	7·9
19	3164	30	Bg	2−4, 3+2	7·8
19	3164	,,	Bn	2 (2) v (1) 3	7·8
20	3165	F	Bo	2 (4) v (2) 3	7·8
20	3165	22	Ni	2 (6) v (4) 3	7·8
21	3166	80	Co	2−2	7·6
22	3167	30	Bn	3+2	7·8
25	3170	32	Ca	d−1, 3+2	7·8
27	3172	30	Bn	3+1·5	7·9
27	3172	80	Co	4+4	7·9
30	3175	160	Br	4+2	8·1
May					
2	3177	80	Co	4+4	7·9
4	3179	F	Bo	2 (4) v (2) 3	7·8
4	3179	55	Bg	3−1, 4+1·5	8·1
4	3179	30	Bn	3+0·5	8·0
5	3180	80	Co	=3, 4+3	8·0
8	3183	,,	,,	4+1	8·2
8	3183	32	Ca	d−2, 3+1	7·9
12	3187	80	Co	=4, 6+2	8·3
13	3188	55	Bg	=4	8·1
13	3188	160	Br	=4	8·1
13	3188	50	Bn	4 (1) v (3) 6	8·1
14	3189	55	Bo	4+1	8·1
15	3190	80	Co	4−1, 6+1	8·1
17	3192	,,	,,	4−2, 6+1	8·1
18	3193	32	Ca	3−2, 4+1	8·1
19	3194	50	Bn	4 (4) v (1) 6	8·1
20	3195	55	Bo	4 (1) v (2) 7	8·1
20	3195	,,	Bg	4−2, =7	8·1
21	3196	80	Co	4−4, 6−1	8·1
22	3197	31	D	4−5, 9+3	8·1
23	3198	22	Ni	4 (4) v (1) 9	8·1
23	3198	80	Co	7−2·5, 8−0·5	8·1
24	3199	,,	,,	9−1, 12+4	9·1
27	3202	,,	,,	9−1, 12+1	9·1
27	3202	55	Bo	7 (3) v (2) 9	8·1
27	3202	160	Br	=12	9·1
27	3202	50	Bn	6 (3) v (2) 9	8·1
28	3203	22	Ni	13 (1) v (4) 16	9·1
28	3203	55	Bg	8−1, 9+1	9·1
31	3206	32	Ca	12−2, 14+2	9·1
June					
1	3207	50	Bn	12 (1) v (2) 14	9·1
4	3210	,,	,,	12 (2) v (1) 14	9·1
4	3210	22	Ni	13 (4) v (1·5) 16	10·1
7	3213	55	Bg	12−2·5, 16+5	9·1
15	3221	80	Co	=18	10·1
19	3225	140	Bo	18 (1) v (3) 19	10·1
20	3226	80	Co	=19	11·1

Apr. 2, Co, Yellow. May 2, Dull yellow.
May 5, 8, Co, Dull yellow.
June 20, Just visible.

(5955) R DRACONIS—*continued.*

1922					
June					
22	3228	80	Ca	19−1, 22+5	11·1*b*
23	3229	55	Bg	18−3, 19+1	10·9*b*
28	3234	79	Ma	=20, 27+5	11·4
July					
10	3246	160	Br	=22	11·6
12	3248	94	Ni	22 (2) v (4) 27	11·7
15	3251	80	Ca	<27	<12·0
19	3255	140	Bo	27 (2) v (3) 32	12·2
19	3255	120	Bn	27 (1) v (3) 32	12·1
20	3256	110	Bg	22−3, 27+1	11·9*b*
21	3257	160	Br	27−1	12·1
30	3266	120	Bn	27 (3) v (1) 32	12·4
31	3267	275	Bo	32 (2) v (1) s	12·7
Aug					
2	3269	120	Br	27−1	12·1
7	3274	75	Bg	=27	12·0*b*
15	3282	94	Ni	27 (4) v (2·5) 32	12·3
16	3283	275	Bo	32 (2) v (1) s	12·7*b*
16	3283	75	Bg	32−1, 34+3	12·6
17	3284	183	Ma	27−5	12·5
20	3287	120	Br	27−2, =32	12·4
21	3288	94	Ni	27 (5) v (2) 32	12·4*b*
23	3290	275	Bo	s−1	13·0
23	3290	75	Bg	32−1, 34+3	12·6
23	3290	85	Bn	=32	12·5*b*
23	3290	183	Ma	27 (2) v (1) 34	12·6
27	3294	94	Ni	27 (5) v (2) 32	12·4
31	3298	75	Bg	=32	12·5*b*
Sept					
10	3308	94	Ni	27 (1·5) v (4) 32	12·2
11	3309	85	Bn	<27	<12·0
15	3313	160	Br	27−3, 32+1	12·4
15	3313	85	Bn	27−3	12·3*b*
17	3315	150	Lp	=27	12·0
18	3316	94	Ni	27 (2) v (4) 32	12·2
20	3318	100	Lp	24 (2) v (2) 27	12·0
20	3318	120	Bn	22 (5) v (2) 27	11·9
20	3318	55	Bg	22−1, 27+3	11·7
24	3322	,,	,,	20−2, 22+1	11·5*b*
24	3322	120	Bn	22 (3) v (2) 27	11·8
26	3324	100	Lp	19 (2) v (2) 22	11·3*b*
29	3327	55	Bo	19 (1) v (2) 20	11·1*b*
29	3327	120	Bn	22 (1) v (4) 27	11·7
Oct					
1	3329	160	Br	22−2, 27+2	11·8
6	3334	120	Bn	19 (4) v (1) 20	11·2
7	3335	90	Hw	19 (5) v (5) 20	11·1
10	3338	30	Co	18−3	10·9*b*
11	3339	75	Bg	19−1, 20+2	11·1
12	3340	100	Lp	18 (2) v (2) 19	10·8*b*
12	3340	55	Bo	18 (2) v (3) 19	10·7
13	3341	94	Ni	=19	11·0
14	3342	30	Co	18−4	11·0*b*
15	3343	100	Lp	18 (2) v (3) 19	10·7*b*
15	3343	120	Bn	19 (1) v (2) 20	11·1
16	3344	55	Bo	18 (1) v (2) 19	10·7
16	3344	75	Bg	=19	11·0*b*
16	3344	90	Hw	19 (5) v (5) 20	11·1*b*
18	3346	100	Lp	18 (1) v (2) 19	10·7
21	3349	94	Ni	18 (6) v (1·5) 19	10·9
21	3349	30	Co	18+2	10·4*b*
21	3349	160	Br	19−3, 22+3	11·3

July 15, Sept. 11, Glimpsed.
Aug. 7, 31, About.
Sept. 20, Lp, Difficult.
Oct. 12, Lp, Ruddy.

1922					
Oct					
22	3350	120	Bn	18 (2) v (1) 19	10·8
22	3350	100	Lp	16 (2) v (2) 18	10·4*b*
24	3352	,,	,,	=17	10·5*b*
26	3354	30	Co	16−3, =17, 18+2	10·4*b*
26	3354	55	Bo	14 (3) v (1) 16	10·1
27	3355	120	Bn	16 (1) v (2) 18	10·3
28	3356	40	Hw	=18	10·6
28	3356	100	Lp	12 (2) v (1) 16	9·9
30	3358	30	Co	12−3·5, 14+1, 16+1	9·8
Nov					
1	3360	55	Bg	9−1, 12+2	9·2
1	3360	50	Bn	12 (3) v (1) 14	9·7
1	3360	100	Lp	9 (2) v (2) 12	9·2*b*
1	3360	30	Co	9−4, 12−1	9·5
4	3363	,,	,,	9−1, 12+2	9·2*b*
4	3363	50	Bn	9 (4) v (1) 12	9·3
4	3363	45	Br	9−1, 12+2	9·2
4	3363	48	Bg	8−1, 9+1	9·0
6	3365	,,	,,	7−2, 8+1·5	8·7
6	3365	50	Bn	9 (1) v (2) 12	9·2
6	3365	30	Co	=8, 9+1·5	8·9
9	3368	,,	,,	=6, 7−1	8·6
9	3368	55	Bg	7−1, 8+2	8·6*b*
9	3368	,,	Bo	7 (1) v (4) 9	8·6*b*
9	3368	37	Lp	=6	8·5*b*
11	3370	,,	,,	4 (2) v (2) 6, =5	8·4*b*
11	3370	94	Ni	4+1	8·2
13	3372	30	Bn	3 (2) v (1) 4	8·2
13	3372	,,	Co	4+3	8·0
15	3374	,,	,,	3+1	7·9
15	3374	37	Lp	=4	8·3*b*
15	3374	90	Hw	=4	8·3*b*
15	3374	31	D	4+1	8·2
17	3376	30	Co	4+3	8·0
18	3377	37	Lp	4+1	8·2
18	3377	25	Bn	3+1	7·9
23	3382	30	Co	=3	8·0
24	3383	37	Lp	4+1	8·2
24	3383	30	Bn	2 (4) v (1) 3	7·9
24	3383	45	Br	4+2	8·1
24	3383	30	Bg	3−0·5, 4+2	8·1
25	3384	55	Bo	2 (4) v (2) 3	7·8
26	3385	22	Ni	2 (8) v (2) 3	7·9
27	3386	25	Bn	2 (3) v (1) 3	7·9
27	3386	30	Co	3+2	7·8*b*
Dec					
1	3390	,,	,,	2 (1) v (1) 3	7·7
5	3394	,,	,,	2−4	7·8*b*
6	3395	37	Lp	2 (2) v (1) 4, =3	8·0*b*
6	3395	30	Bn	2 (3) v (1) 3	7·9
6	3395	,,	Bg	2−4, 3+2	7·8*b*
8	3397	,,	Co	2−4	7·8
11	3400	45	Br	4+4	7·9
15	3404	30	Co	2−3	7·7*b*
16	3405	,,	Bg	2−5, 3+1	7·9*b*
17	3406	,,	Co	2−4	7·8
18	3407	,,	Bn	2 (2) v (1) 3	7·8
19	3408	22	Ni	2 (6) v (4) 3	7·8
19	3408	30	Co	3+2·5	7·8*b*
20	3409	37	Lp	2 (3) v (2) 4, 3+1	7·9

Nov. 4, Co, Difficult.
Nov. 11, Ni, With 22, 8·2.
Dec. 1, 5, 8, 5^{c}.
Dec. 15, 3^{c}.
Dec. 20, Lp, Rather ruddy.

(5955) R DRACONIS—*continued.*

1922 Dec					
20	3409	31	D	2−3, 4+7	7·7
20	3409	26	Bg	2−5, 3+1	7·9
20	3409	F	Bo	d (1) v (3) 3	7·8*b*
22	3411	30	Co	3+2	7·8
23	3412	100	Lp	2 (2) v (1) 3	7·8
23	3412	30	Bn	2 (2) v (1) 3	7·8
24	3413	,,	Co	3+2	7·8*b*
26	3415	,,	,,	3+3	7·7
26	3415	90	Hw	1 (8) v (2) 4	8·0
30	3419	22	Ni	2 (5) v (4) 3	7·8
30	3419	55	Bo	d (3) v (1) 3	7·9*b*
31	3420	30	Co	3+3	7·7
1923 Jan					
2	3422	37	Lp	2 (2) v (1) 3	7·8*b*
3	3423	30	Co	3+2·5	7·8
3	3423	,,	Bn	2−4, 3+2	7·8
3	3423	48	Bg	3−1, 4+2	8·1*b*
6	3426	45	Bh	1−5, 4+10	7·3
6	3426	37	Lp	3+1, 4+2	8·0
8	3428	22	Ni	2 (6·5) v (2·5) 3	7·9
8	3428	30	Co	=3	8·0
8	3428	,,	Bn	2−4, 3+1	7·9
10	3430	,,	,,	3+0·5	8·0
10	3430	55	Bg	=4	8·3
10	3430	30	Co	3−1, 4+4	8·0
12	3432	,,	,,	=3, 4+4	8·0
12	3432	37	Lp	4 (1) v (2) 7, 4−1	8·4*b*
14	3434	,,	,,	4 (2) v (2) 7	8·4*b*
14	3434	34	Li	3 (7) v (3) 4	8·2
14	3434	22	Ni	2 (7) v (2) 3	7·9
14	3434	45	Bh	1−10, 4+3	7·9
14	3434	30	Bn	3 (1) v (1) 4	8·2
15	3435	55	Bg	4−1, 7+1	8·4
16	3436	37	Lp	=7	8·5
16	3436	40	Hw	1 (8) 4 (2) v	8·6
16	3436	30	Co	3−1, 4+3	8·1*b*
18	3438	,,	Bn	3 (3) v (1) 4	8·2
18	3438	160	Br	4−1	8·4
20	3440	34	Li	=4	8·3
20	3440	37	Lp	=7	8·5
23	3443	100	,,	4 (1) v (2) 9, 7 (1) v (2) 8	8·6*b*
23	3443	31	D	4−2	8·5
23	3443	30	Co	4−0·5, =6	8·4
23	3443	,,	Bn	4 (1) v (1) 6	8·4
24	3444	45	Bh	4−2, 12+9	8·5
25	3445	50	Bn	6+0·5	8·5
25	3445	30	Co	=4	8·3
30	3450	45	Bh	4−5, 12+6	8·8
Feb					
3	3454	,,	,,	4−10, 12+1	9·3
4	3455	,,	Br	9−2, 12+2	9·2
4	3455	50	Bn	6 (4) v (1) 9	9·0
4	3455	100	Lp	=9	9·1*b*
4	3455	30	Co	9−2, =12	9·3*b*
5	3456	40	Hw	=9	9·1*b*
6	3457	22	Ni	9 (2) v (1·5) 13	9·4
11	3462	50	Bn	12 (1) v (4) 14	9·5
11	3462	30	Co	12−2	9·6*b*
16	3467	80	,,	=16, 17+3	10·2*b*
16	3467	45	Bh	12−4	9·8
17	3468	22	Ni	13 (2) v (2) 16	9·9
18	3469	55	Bg	12−2, 16+6	9·6
21	3472	37	Lp	16 (2) v (2) 17	10·3*b*

Jan. 6, Lp, Orange-yellow.

1923 Feb					
21	3472	80	Co	=17	10·5
23	3474	40	Hw	16 (5) v (5) 18	10·4
23	3474	55	Bg	12−6, 16+2	10·0
25	3476	90	Bh	12−12, =18	10·6
Mar					
5	3484	,,	,,	18−2, 19+1	10·8
5	3484	80	Co	=18	10·6
6	3485	120	Bn	19 (1) v (2) 20	11·1
6	3485	100	Lp	=18	10·6
8	3487	45	Bh	=19	11·0
16	3495	94	Ni	=20	11·3
17	3496	120	Bn	19 (3) v (1) 20	11·2
17	3496	45	Bh	19−3, 22+3	11·3
18	3497	55	Bg	19−1, 20+2	11·1
18	3497	94	Li	20 (5) v (5) 22	11·4
26	3505	75	Bg	=20	11·3
27	3506	94	Ni	=22	11·6
27	3506	90	Bh	19−10, 8+10	11·9
Apr					
1	3511	,,	,,	=27, 32+5, 8+10	12·0
4	3514	120	Bn	22 (2) v (1) 27	11·9
4	3514	75	Bg	20−2, =22	11·5
5	3515	94	Ni	=27	12·0
10	3520	,,	,,	27 (2) v (3) 32	12·2
13	3523	103	Li	=27	12·0
13	3523	120	Bn	27+1	11·9
14	3524	75	Bg	22−2, 27+2	11·8
14	3524	130	Ma	=27	12·0
16	3526	90	Bh	27−1	12·1
20	3530	75	Bg	22 (4) v (1) 27	11·9
20	3530	60	D	<27	<12·0
22	3532	90	Bh	27−3, 8+5	12·3
24	3534	94	Ni	27 (4) v (2·5) 32	12·3
May					
3	3543	75	Bg	22 (2) v (3) 27	11·8
3	3543	120	Br	27−1, 32+2	12·2
4	3544	94	Ni	27 (3) v (3) 32	12·3
5	3545	120	Bn	27 (1) v (3) 32	12·1
10	3550	,,	D	27−3	12·3
11	3551	90	Bh	19−10, 27+2	11·9
12	3552	103	Li	=27	12·0
14	3554	60	D	20−6, 27+3	11·8
16	3556	120	Bn	22 (2) v (1) 27	11·9
16	3556	75	Bg	=22	11·6
17	3557	90	Bh	=22	11·6
21	3561	120	Bn	22 (1) v (2) 27	11·7
24	3564	60	D	=27	12·0
25	3565	100	Lp	19 (2) v (2) 20	11·1
30	3570	90	Bh	19−2, 27+8	11·2
June					
3	3574	45	,,	=19	11·0
6	3577	60	D	=19	11·0
10	3581	,,	,,	18−3, 19+1	10·9
11	3582	120	Bn	18 (2) v (1) 19	10·8
11	3582	100	Lp	=18	10·6
18	3589	60	D	18−2, 19+2	10·8
21	3592	90	Bh	19+4	10·6
22	3593	37	Lp	16 (2) v (2) 17	10·3
26	3597	60	D	16−2, 18+2	10·4
July					
1	3602	90	Bh	18+3, 19+7	10·3
1	3602	60	D	12 (4) v (1) 16, 16+2	10·0

Apr. 13, Bn, t.
May 10, A glimpse.
May 24, About

(5955) R DRACONIS—*continued.*

1923					
July					
4	3605	60	D	12−4, 16+3	9·8
4	3605	100	Lp	12 (2) v (1) 16	9·9
4	3605	50	Bn	12 (1) v (1) 14	9·6
4	3605	55	Bg	9 (2) v (1) 12	9·3
5	3606	22	Ni	9 (4) v (1) 13	9·5*b*
5	3606	30	Co	9−1, 12+1	9·2*b*
6	3607	,,	D	12−4, 16+3	9·8
7	3608	,,	,,	12−2, 16+5	9·6
8	3609	55	Bg	8 (2) v (1) 9	9·0
10	3611	22	Ni	9 (1) v (4) 13	9·2
11	3612	30	Co	7−1, 8+2	8·6
11	3612	55	Bg	=8, 9−2	9·1
12	3613	37	Lp	9 (2) v (2) 12	9·2
12	3613	30	D	6−1, 9+5	8·6
14	3615	45	Bh	3−5	8·5
16	3617	30	D	2 (4) v (1) 4, 4+2	8·1
18	3619	37	Lp	2 (4) v (1) 3,	8·1
				2 (4) v (1) 4,	
				3 (2) v (2) 4	
20	3621	30	D	2 (3) v (2) 4, 4+4	7·9
20	3621	,,	Co	=3, 4+2·5	8·0
20	3621	37	Lp	2 (3) v (1) 4,	7·9*b*
				v (2) 4 (3) 9	
20	3621	45	Bh	=3	8·0
20	3621	55	Bg	3 (2) v (1) 4	8·2
21	3622	30	Bn	3+2	7·8
21	3622	34	Li	2 (2) v (8) 3	7·6
22	3623	37	Lp	2 (2) v (1) 4, 4+5	7·9*b*
25	3626	50	Bn	2 (2) v (1) 3	7·8
25	3626	30	Co	4+5	7·8
26	3627	37	Lp	2 (2) v (3) 4	7·8*b*
26	3627	45	Bh	d−1, 3+3	7·7
27	3628	30	D	=2	7·4
Aug					
1	3633	22	Ni	2 (3) v (7) 3	7·6
1	3633	45	Bh	1−3, =2	7·3
2	3634	30	Bg	=2	7·4
2	3634	,,	Co	=2	7·4
3	3635	45	Bh	1−1, 2+4	7·0
3	3635	25	Bn	2 (1) v (4) 3	7·6
4	3636	OG	Ph	1 (2) v (1) 4, 4+7	7·7
4	3636	30	Co	2−2	7·6
5	3637	,,	Bg	1 (1) v (3) 2	7·0
6	3638	120	Ga	1−5	7·4
8	3640	30	Bg	1 (1) v (1) 2	7·2
8	3640	25	Bn	=2	7·4
8	3640	45	Bh	1−1, 2+4	7·0
9	3641	,,	Br	2−1	7·5
10	3642	OG	Ph	1 (2) v (1) 4, 4+7	7·7*b*
11	3643	45	Bh	1−6, 2−1	7·5
11	3643	30	Co	2−2	7·6
11	3643	F	Lp	1 (2) v (2) 2	7·2*b*
11	3643	30	D	1−2, 2+3	7·1
13	3645	37	Lp	2−1	7·5*b*
13	3645	25	Bn	2−1	7·5
15	3647	,,	,,	2−1, 3+5	7·5
15	3647	30	Co	2−2	7·6
15	3647	45	Bh	2−1, 4+5	7·7
18	3650	,,	,,	=4, 8+3	8·3

July 20, D, 4[c].
July 21, Li, Difficult.
July 27, 2[c].
Aug. 2, 4, Co, Yellow.
Aug. 11, Lp, Probably rated much too high. D, 2[c].
Aug. 15, Co, Dull yellow.

1923					
Aug					
18	3650	37	Lp	=2	7·4*b*
18	3650	25	Bn	2−2	7·6
21	3653	37	Lp	2 (1) v (2) 4, 4+5	7·7*b*
21	3653	30	Co	2−3	7·7*b*
22	3654	,,	D	2−3, 4+6	7·7
22	3654	,,	Bg	2 (1) v (4) 3	7·6
22	3654	,,	Bn	2 (2) v (3) 3	7·7
24	3656	25	,,	2 (2) v (1) 3	7·8
26	3658	90	Bh	2−2, 4+7	7·6
26	3658	37	Lp	2 (2) v (2) 4	7·9*b*
26	3658	30	Co	2 (2) v (2) 4	7·9
28	3660	,,	,,	4+3	8·0
30	3662	,,	,,	=3, 4+3·5	8·0
30	3662	37	Lp	2 (2) v (1) 4	8·0*b*
30	3662	25	Bn	2 (3) v (1) 3	7·9
31	3663	90	Bh	4+1	8·2
Sept					
2	3665	22	Ni	=3	8·0
2	3665	30	D	2 (3) v (2) 4, 4+4	7·9
3	3666	37	Lp	4+1	8·2*b*
3	3666	30	Co	=4	8·3
5	3668	50	Bn	3+1·5	7·9
6	3669	60	Ga	4+5	7·8
6	3669	30	Co	4−2, 7+2	8·4
6	3669	50	Ma	4+3	8·0
6	3669	22	Ni	3 (2) v (1) 4	8·2
7	3670	90	Bh	4+1	8·2
7	3670	37	Lp	=4	8·3
8	3671	30	D	4+2	8·1
8	3671	120	Br	4+1	8·2
8	3671	25	Bn	3+1, 4+4	7·9
8	3671	30	Bg	=3	8·0
9	3672	,,	Co	4−2	8·5
11	3674	,,	,,	4−3, 6+2	8·5
11	3674	37	Lp	=6	8·5
13	3676	90	Bh	=4	8·3
13	3676	55	Bg	3 (3) v (1) 4	8·2
13	3676	30	Co	4−3·5, 7+1·5	8·5*b*
15	3678	,,	,,	=6, 7+0·5	8·5
15	3678	100	Lp	4 (2) v (2) 9, =8	8·8
16	3679	25	Bn	3 (1) v (1) 4	8·2
16	3679	50	Ma	4 (1) v (1) 12, 4−2·5	8·7
17	3680	40	Hw	=9	9·1
17	3680	30	Co	6−1, =7	8·6
17	3680	37	Lp	4 (2) v (1) 9,	8·7*b*
				6 (2) v (2) 8	
18	3681	30	D	=6	8·5*b*
18	3681	22	Ni	4 (4) v (1·5) 9	8·8
21	3684	30	Co	8+1, 9+4	8·7*b*
21	3684	25	Bn	4 (3) v (2) 6	8·4
21	3684	100	Lp	4 (2) v (1) 9	8·8*b*
26	3689	90	Bh	4−6, 12+5	8·9
28	3691	30	Co	9−1, 12+2·5	9·2
29	3692	50	Bn	12 (2) v (3) 14	9·6
30	3693	45	Br	=12	9·4
30	3693	55	Bg	12 (1) v (3) 16	9·6
30	3693	100	Lp	12 (2) v (2) 16	9·8*b*
30	3693	30	D	12−4, 16+4	9·8
30	3693	,,	Co	9−3, =12	9·4
30	3693	22	Ni	9 (3) v (1) 13	9·5

Aug. 21, Co, Yellow.
Aug. 22, D, 3-in. OG.
Sept. 2, D, 4[c].
Sept. 6, Ga, T.
Sept. 8, D, 4[c].

(5955) R DRACONIS—*continued.*

1923 Oct					
1	3694	90	Bh	=12	9·4
4	3697	50	Bn	12 (3) v (1) 14	9·7
4	3697	40	Hw	16 (5) v (5) 18	10·4
4	3697	100	Lp	12 (2) v (2) 16	9·8
4	3697	50	Ma	12 (1) v (1) 16	9·8
6	3699	60	Ga	16−2, =17	10·4
8	3701	30	Co	16−2·5, =17	10·4
9	3702	90	Bh	=16	10·2*b*
11	3704	45	Br	12−4, 16+4	9·8
12	3705	90	Bh	16−1	10·3
12	3705	30	Co	17−4, 18−2	10·8
13	3706	100	Lp	17 (2) v (2) 18	10·5*b*
14	3707	55	Bg	=16	10·2
14	3707	120	Bn	16 (4) v (1) 18	10·5
15	3708	40	Hw	=19	11·0
15	3708	60	D	18−3, 19+2	10·8
16	3709	,,	Ga	17−2, =18	10·6
20	3713	90	Bh	16−3	10·5*b*
21	3714	50	Ma	16−2, 18−1	10·5
22	3715	75	Bg	18 (1) v (2) 19	10·7
22	3715	120	Bn	18 (2) v (1) 19	10·8
25	3718	94	Ni	17+0·5	10·4
25	3718	90	Bh	16−5, =18	10·6*b*
26	3719	,,	Hw	=19	11·0*b*
27	3720	75	Bg	19 (1) v (3) 20	11·0
28	3721	120	Bn	18 (4) v (1) 19	10·9
Nov					
1	3725	90	Bh	18−2, 19+2	10·8*b*
3	3727	120	Bn	19 (3) v (1) 20	11·2
3	3727	100	Lp	=19	11·0
4	3728	94	Ni	17 (3) v (2) 20	10·9
4	3728	60	D	19−2, 20+1	11·2
4	3728	75	Bg	19 (1) v (1) 20	11·1*b*
5	3729	160	Br	19−1, 20+2	11·1
7	3731	90	Bh	=19	11·0
7	3731	120	Bn	19 (3) v (1) 20	11·2
10	3734	,,	,,	20 (2) v (1) 22	11·5
10	3734	90	Hw	19 (5) v (5) 20	11·1
10	3734	79	Ma	19 (1) v (1) 20	11·1
11	3735	90	Bh	19−3	11·3
12	3736	75	Bg	=20	11·3*b*
14	3738	94	Ni	17 (2) v (3) 20	10·8
14	3738	120	Bn	22+2	11·4
16	3740	160	Br	=20	11·3
16	3740	90	Bh	18−5, 19−2	11·1
19	3743	120	Bn	22+1	11·5
23	3747	150	Bh	19−5	11·5
30	3754	90	,,	19−7, 27+3	11·7
30	3754	120	Bn	22 (3) v (1) 27	11·9
Dec					
2	3756	75	Bg	=22	11·6*b*
4	3758	120	Bn	27+1	11·9
4	3758	90	Bh	27+3	11·7
8	3762	,,	,,	27+2	11·8
8	3762	120	Br	22−3, 27+1	11·9
9	3763	94	Ni	27 (2) v (4) 32	12·2*b*
16	3770	120	Bn	22 (3) v (2) 27	11·8
16	3770	142	Bg	<27	<12·0*b*
16	3770	150	Lp	20 (2) v (2) 27	11·6*b*
18	3772	90	Bh	27+2	11·8*b*
24	3778	,,	,,	=27	12·0*b*
28	3782	120	Br	=27	12·0
28	3782	90	Bh	=27	12·0
30	3784	183	Ma	27+1	11·9

Oct. 6, 16, T.
Dec. 2, About.
Dec. 30, Very difficult.

1924 Jan					
2	3787	120	Bn	22 (4) v (1) 27	11·9
2	3787	150	Lp	=22	11·6
3	3788	75	Bg	=22	11·6
3	3788	90	Bh	27+1	11·9
5	3790	,,	,,	27+2	11·8
6	3791	120	Br	27−1	12·1
6	3791	60	D	27+2	11·8
6	3791	94	Ni	27 (1) v (4) 32	12·1
6	3791	120	Bn	22 (1) v (2) 27	11·7
11	3796	90	Bh	19−5, 27+5	11·5
14	3799	120	Bn	20 (4) v (1) 22	11·5
17	3802	90	Bh	19−2	11·2
23	3808	,,	,,	18−3, 19+1	10·9
25	3810	,,	,,	19−1	11·1
25	3810	120	Bn	19 (3) v (1) 20	11·2
27	3812	75	Bg	19 (1) v (2) 20	11·1
27	3812	150	Lp	18 (1) v (2) 19, 18−1	10·7
27	3812	120	Br	22−1, 27+3	11·7
27	3812	94	Ni	20 (1) v (2) 22	11·4
27	3812	60	D	=20	11·3
28	3813	,,	,,	19−2, 20+1	11·2
29	3814	120	Bn	19 (2) v (1) 20	11·2
31	3816	90	Bh	19+2	10·8
Feb					
1	3817	120	Bn	19 (1) v (2) 20	11·1
1	3817	100	Lp	18 (2) v (2) 19	10·8
1	3817	60	D	18−3, 19+1	10·9
4	3820	100	Lp	18 (1) v (2) 19	10·7
4	3820	90	Bh	19+2	10·8
8	3824	60	D	18−1, 19+3	10·7
8	3824	40	Hw	=18	10·6
8	3824	94	Ni	19+1	10·9
11	3827	90	Bh	18−1, 19+3	10·7
14	3830	,,	,,	12 (3) v (1) 19	10·6
14	3830	100	Lp	17 (2) v (2) 18	10·5
14	3830	60	D	16−3, 18+1	10·5
16	3832	50	Bn	14−3, 16+1	10·1
18	3834	45	Bh	12−5	9·9
21	3837	90	,,	12−3	9·7
21	3837	94	Ni	9 (5) v (2) 13	9·5
22	3838	90	Bh	12−2	9·6
24	3840	160	Br	12−2, 16+5	9·6
24	3840	90	Bh	9−3, =12	9·4
26	3842	,,	,,	9−2, 12+2	9·2
26	3842	50	Bn	9 (3) v (1) 12	9·3
28	3844	90	Bh	=9, =12	9·2
28	3844	30	D	9+0·5	9·0
28	3844	,,	Co	9−3, =12	9·4
29	3845	22	Ni	4 (6) v (1·5) 9	8·9
Mar					
1	3846	45	Bh	9−1	9·2
1	3846	30	Co	9−1, 12+2	9·2
2	3847	100	Lp	4 (1) v (2) 9, =6	8·5
4	3849	37	,,	6 (2) v (3) 9	8·7
4	3849	30	Co	=4	8·3
4	3849	90	Bh	4−4, 9+4	8·7
4	3849	50	Bn	6 (5) v (2) 9	8·9
4	3849	55	Bg	7 (1) v (3) 8	8·6
4	3849	40	D	4 (3) v (2) 9, 9+5	8·7
5	3850	30	,,	4−5, 9+3	8·8
5	3850	40	Hw	=4	8·3
6	3851	30	Co	4+1·5	8·1

Jan. 3, Bg, About.
Jan. 6, D, A glimpse.
Jan. 27, Lp, Difficult. Ni, Difficult. Unsteady. Bad sky. D, About.
Mar. 4, D, 4c.

(5955) R DRACONIS—*continued.*

1924					
Mar					
7	3852	22	Ni	4 (2) v (4) 9	8·5
7	3852	90	Bh	4−1	8·4
7	3852	50	Bn	4 (4) v (1) 6	8·5
8	3853	55	Bg	4−2, =7	8·5
8	3853	100	Lp	4 (2) v (2) 6	8·4*b*
8	3853	30	Co	4+4	7·9
8	3853	,,	D	4−4, 9+5	8·6
9	3854	90	Bh	4+1	8·2
10	3855	55	Bg	3 (1) v (1) 4	8·2
10	3855	50	Bn	4+1	8·2
11	3856	100	Lp	=4	8·3*b*
11	3856	90	Bh	4+2	8·1
11	3856	30	Co	=3	8·0
11	3856	,,	D	4−1	8·4
12	3857	30	Bg	=3	8·0
13	3858	50	Bn	3 (1) v (2) 4	8·1
13	3858	30	Co	3+2	7·8
16	3861	,,	,,	3+3	7·7
16	3861	26	Bg	2 (3) v (1) 3	7·9*b*
19	3864	25	Bn	2−4, 3+2	7·8
19	3864	90	Bh	4+2	8·1
22	3867	,,	,,	=3, 4+3	8·0
23	3868	30	D	2 (1) v (3) 4, 2−2	7·6
24	3869	,,	Bg	2 (1) v (2) 3	7·6
24	3869	40	Hw	v (3) 4 (7) 9	7·9*b*
26	3871	45	Bh	2−3, 4+5	7·8
28	3873	30	Co	=2	7·4
29	3874	25	Bn	2+1	7·3
29	3874	F	Lp	2 (2) v (1) 3	7·8
29	3874	45	Br	=2	7·4
29	3874	,,	Bh	2−2, 4+6	7·7
29	3874	22	Ni	1−6, =b, 2+2	7·3
30	3875	30	D	2 (3) v (2) 4, 4+5	7·9
30	3875	,,	Bg	2 (1) v (2) 3	7·6
30	3875	,,	Co	2−2	7·6
Apr					
1	3877	,,	,,	2+1	7·3
1	3877	37	Lp	2 (3) v (2) 4	7·9
1	3877	25	Bn	1−3·5, 2+2	7·2
4	3880	,,	,,	1−4, 2+1·5	7·3
4	3880	90	Bh	1 (2) v (1) 2	7·3
4	3880	30	Co	=2	7·4
4	3880	,,	D	=2	7·4
5	3881	40	Hw	1 (5) v (5) 4	7·6
5	3881	30	Bg	2 (1) v (5) 3	7·5
7	3883	,,	Co	2−2	7·6
7	3883	37	Lp	2 (3) v (2) 4	7·9*b*
7	3883	25	Bn	1−4·5, 2+1	7·3
8	3884	45	Bh	1 (1) v (1) 2	7·2
8	3884	60	Kw	1−6, =2	7·5
9	3885	25	Bn	1−4, 2+2	7·3
10	3886	30	D	2+1	7·3*b*
11	3887	45	Bh	1−3, 2+3	7·2
14	3890	30	Co	2−2	7·6
14	3890	45	Bh	1−1, 2+4	7·0
14	3890	25	Bn	1 (4) v (1) 2	7·3
15	3891	30	Bg	2 (1) v (4) 3	7·6
15	3891	37	Lp	2 (1) v (2) 4	7·7*b*
16	3892	30	Co	2−1	7·5
16	3892	,,	D	=2	7·4*b*
17	3893	22	Ni	2 (5) v (5) 3	7·7*b*

Mar. 8, D, 5c.
Mar. 11, 23, D, 3c.
Mar. 28, White with red tinge.
Mar. 30, Apr. 4, D, 2c.
April 8, Kw, T.

1924					
Apr					
20	3896	30	Co	2−1·5	7·6
20	3896	25	Bn	1 (5) v (2) 2	7·3
20	3896	30	Bg	2 (1) v (5) 3	7·5
20	3896	45	Bh	1 (1) v (1) 2	7·2
25	3901	,,	,,	1−3, 2+2	7·2
25	3901	30	D	2 (2) v (1) 4, 4+4	8·0*b*
25	3901	,,	Co	2−3	7·7
29	3905	22	Ni	2 (5) v (4) 3	7·8
30	3906	45	Bh	1 (1) v (1) 2	7·2
May					
1	3907	50	Ma	4+5	7·8
1	3907	25	Bn	2 (2) v (3) 3	7·7
1	3907	60	Kw	1 (2) v (1) 4, 2−5	7·9*b*
2	3908	30	Bg	2 (1) v (1) 3	7·7*b*
3	3909	45	Bh	=2	7·4*b*
4	3910	30	D	2 (4) v (1) 4, 4+2	8·1
5	3911	25	Bn	3+1	7·9
5	3911	45	Bh	=2	7·4
7	3913	22	Ni	2 (6·5) v (3) 3	7·8
7	3913	30	D	2 (3) v (1)·4, 4+3	8·0
9	3915	,,	,,	4+1	8·2
10	3916	45	Bh	d−1, 4+5	7·8
13	3919	60	D	4+1	8·2
13	3919	30	Co	=3, 4+3	8·0
13	3919	90	Bh	4+3	8·0
13	3919	37	Lp	4+2	8·1*b*
16	3922	55	Bg	3 (2) v (1) 4	8·2
16	3922	50	Bn	4 (1) v (1) 6	8·4
18	3924	45	Bh	4+1	8·2*b*
19	3925	50	Bn	4 (2) v (1) 6	8·4
21	3927	30	D	=4	8·3
24	3930	,,	,,	=4	8·3
24	3930	22	Ni	4 (4) v (2) 9	8·8
25	3931	50	Ma	6−4, 9+1, 12+4	8·9
26	3932	90	Bh	4−1	8·4
27	3933	30	D	4−2, 6+1	8·5
27	3933	37	Lp	=6	8·5
27	3933	50	Bn	6 (2) v (1) 9	8·9
28	3934	30	Co	6−2, 9+1	8·8
28	3934	90	Bh	4−4	8·7
30	3936	55	Bg	7 (1) v (3) 8	8·6
30	3936	30	D	6−2, 9+3	8·7
June					
1	3938	,,	,,	=9	9·1
2	3939	50	Ma	9 (1) v (1) 12, 12+1	9·3
5	3942	55	Bg	7 (3) v (1) 8	8·8
5	3942	30	D	9−3, 12+1	9·3
10	3947	90	Bh	4 (3) v (1) 12	9·1
12	3949	60	D	12−5, 16+3	9·9
13	3950	90	Bh	12+1	9·3
14	3951	50	Bn	12 (1) v (2) 14	9·5
15	3952	30	Co	9−2, 12+1	9·3
18	3955	90	Bh	12−1	9·5
22	3959	75	Bg	16 (1) v (1) 18	10·4
22	3959	60	D	16−1, 18+3	10·3
23	3960	100	Lp	=16	10·2*b*
24	3961	90	Bh	12−5	9·9
26	3963	60	D	18−1, 19+3	10·7
30	3967	,,	,,	18−3, 19+1	10·9
30	3967	90	Bh	12 (2) v (3) 19, =16	10·1
July					
2	3969	94	Ni	19+3	10·7
3	3970	90	Bh	16−1	10·3

April 25, May 4, 7, D, 3c.
May 1, Kw, T.
May 9, 13, D, 2c.

(5955) R DRACONIS—*continued.*

1924					
July					
6	3973	60	D	=19	11·0
6	3973	M	Ph	18 (1) v (1) 20, =19	10·9
6	3973	75	Bg	18 (1) v (3) 19	10·7*b*
9	3976	90	Bh	16 (1) v (2) 19	10·4
9	3976	60	D	19−2, 20+2	11·1
9	3976	94	Ni	19+1	10·9
10	3977	120	Bn	18 (3) v (1) 19	10·9
13	3980	M	Ph	17 (1) v (1) 22, =20	11·1
13	3980	150	Lp	=20	11·3*b*
14	3981	120	Bn	19 (4) v (1) 20	11·2
14	3981	,,	D	19−2, 20+1	11·2
19	3986	30	Co	=19	11·0*b*
19	3986	90	Bh	16 (2) v (1) 19	10·7
21	3988	120	Bn	19 (2) v (1) 20	11·2
21	3988	100	Lp	20 (2) v (2) 22	11·4
22	3989	94	Ni	22 (2) v (4) 27	11·7
24	3991	90	Bh	19+1	10·9
29	3996	,,	,,	=19	11·0
29	3996	120	Bn	20 (1) v (2) 22	11·4
29	3996	M	Ph	22−2, 27+2	11·8
31	3998	120	D	20−4, 27+3	11·7
Aug					
2	4000	,,	Bn	20 (2) v (1) 22	11·5
2	4000	90	Bh	19 (1) v (2) 27	11·3
5	4003	100	Lp	20 (2) v (2) 27, 24+1	11·7
7	4005	120	Bn	22+1	11·5
8	4006	90	Bh	27+3	11·7
9	4007	120	D	20−5, 27+2	11·8
9	4007	180	Bg	22 (1) v (2) 27	11·7
15	4013	90	Bh	27+2	11·8
18	4016	79	Ma	=27	12·0
19	4017	90	Bh	27+2	11·8
19	4017	120	Br	=22	11·6
19	4017	,,	Bn	27−1·5	12·2
19	4017	75	Bg	22 (1) v (3) 27	11·7
27	4025	120	D	20−5, 27+3	11·7
27	4025	90	Bh	27+1	11·9
31	4029	100	Lp	=24, =27	12·0
31	4029	75	Bg	20 (2) v (1) 22	11·5
Sept					
2	4031	90	Bh	27+1	11·9
4	4033	,,	,,	27+2	11·8*b*
5	4034	79	Ma	27+2	11·8
5	4034	,,	Bn	22 (3) v (2) 27	11·8
9	4038	120	,,	22 (3) v (2) 27	11·8
9	4038	130	Ma	27+2	11·8
9	4038	90	Bh	20−4	11·7*b*
12	4041	94	Ni	19 (3) v (1) 20	11·2
14	4043	120	Bn	22 (1) v (1) 27	11·8*b*
16	4045	90	Bh	18−5, =19	11·0
22	4051	75	Bg	=19	11·0
22	4051	120	Bn	20 (1) v (2) 22	11·4
22	4051	100	Lp	19 (1) v (2) 20	11·1
22	4051	60	D	19−2, 20+1	11·2
22	4051	90	Hw	=19	11·0*b*
23	4052	,,	Bh	18−4	11·0
26	4055	,,	,,	18 (1) v (3) 20	10·7*b*
27	4056	160	Br	18−2, 19+2	10·8
27	4056	120	Bn	19 (3) v (2) 20	11·1
29	4058	79	Ma	18+1	10·5
29	4058	62	D	=19	11·0
29	4058	90	Bh	18−1	10·7
Oct					
2	4061	,,	,,	=18	10·6

Aug. 31, Lp, Ruddy.
Sept. 5, Bn, 8½-in. mirror.

1924					
Oct					
2	4061	79	Ma	18 (1) v (3) 19	10·7
3	4062	100	Lp	=18	10·6*b*
8	4067	75	Bg	16 (2) v (1) 18	10·4
8	4067	60	Kw	16−2, 18+3	10·3
11	4070	90	Bh	16 (1) v (1) 18	10·4
12	4071	50	Bn	14 (2) v (1) 16	10·0
13	4072	90	Hw	=18	10·6*b*
15	4074	,,	Bh	12 (1) v (1) 18	10·0
17	4076	100	Lp	12 (1) v (2) 16	9·7*b*
17	4076	160	Br	12−5, 16+2	9·9
22	4081	50	Bn	=12	9·4
23	4082	75	Bg	12 (1) v (3) 16	9·6
23	4082	100	Lp	9 (2) v (1) 12	9·3
23	4082	40	Hw	12 (7) v (3) 16	9·9
23	4082	22	Ni	9 (4) v (1) 13	9·5
23	4082	90	Bh	12−3	9·7
25	4084	,,	,,	=12	9·4
27	4086	,,	,,	4 (2) v (1) 12	9·0
27	4086	79	Ma	9+1	9·0
30	4089	55	Bg	=9	9·1
31	4090	90	Bh	4−3	8·6
Nov					
3	4093	,,	,,	4+1	8·2
3	4093	31	D	4−2	8·5
3	4093	45	Br	4−1	8·4
3	4093	50	Bn	4+1	8·2
4	4094	40	Hw	=4	8·3
4	4094	75	Lp	=7	8·5*b*
4	4094	34	Li	=3	8·0
4	4094	22	Ni	4 (1) v (5) 9	8·4
5	4095	90	Bh	4+2	8·1
8	4098	45	,,	1 (4) v (1) 4	8·0
10	4100	,,	,,	1 (2) v (1) 4	7·8
10	4100	25	Bn	3+2	7·8
10	4100	34	Li	2 (6) v (4) 3	7·8
15	4105	45	Bh	1 (2) v (3) 4	7·4
16	4106	22	Ni	2 (5) v (5) 3	7·7
16	4106	50	Ma	2−2	7·6
16	4106	25	Bn	2 (2) v (1) 3	7·8
17	4107	34	Li	2 (3) v (7) 3	7·6
17	4107	30	Bg	2 (2) v (1) 3	7·8*b*
19	4109	45	Bh	1 (2) v (3) 4	7·4
24	4114	,,	,,	1 (2) v (3) 4	7·4
27	4117	30	Bg	2 (1) v (2) 3	7·6
27	4117	40	Hw	1 (5) v (5) 4	7·6*b*
27	4117	75	Lp	2 (4) v (1) 4	8·1*b*
27	4117	25	Bn	2+1	7·3
28	4118	45	Bh	2−3, 4+6	7·7
30	4120	30	D	2 (1) v (4) 4, 2−2	7·6
30	4120	50	Bn	2−1	7·5
30	4120	22	Ni	2 (2·5) v (6) 3	7·6
Dec					
1	4121	45	Bh	2−1	7·5
3	4123	34	Li	=2	7·4
5	4125	30	Bg	2 (1) v (5) 3	7·5
5	4125	45	Bh	=2	7·4
5	4125	75	Lp	2 (2) v (2) 4	7·9
6	4126	25	Bn	2−2, 3+4	7·6
6	4126	34	Li	2 (1) v (9) 3	7·5
6	4126	50	Ma	4+5	7·8
8	4128	60	D	1−4, 2+2	7·3
9	4129	25	Bn	2 (1) v (1) 3	7·7
9	4129	40	Hw	1 (7) v (3) 4	7·9

Oct. 8, Kw, T.
Nov. 16, Ma, Pale red.
Nov. 30, Dec. 8, D, 2^{c}.

(5955) R DRACONIS—*continued.*

1924 Dec					
9	4129	45	Bh	1 (2) v (3) 4	7·4
10	4130	34	Li	2 (2) v (8) 3	7·6
12	4132	45	Bh	3+1	7·9
14	4134	,,	,,	3+1	7·9
14	4134	30	Bg	2 (1) v (1) 3	7·7
14	4134	25	Bn	2 (3) v (2) 3	7·8
14	4134	75	Lp	2 (4) v (1) 4	8·1*b*
19	4139	45	Bh	3 (3) v (1) 4	8·2
22	4142	40	Hw	1 (7) v (3) 4	7·9
22	4142	30	D	2 (3) v (1) 4, 4+3	8·0

Dec. 22, D, 3^c.

1924 Dec					
22	4142	30	Bg	2 (5) v (1) 3	7·9
24	4144	25	Bn	2 (1) v (1) 3	7·7
24	4144	22	Ni	2 (6) v (4) 3	7·8
24	4144	45	Bh	3 (2) v (1) 4	8·2
25	4145	90	,,	4+2	8·1
26	4146	25	Bn	2 (3) v (2) 3	7·8
28	4148	30	Bg	2 (6) v (1) 3	7·9
28	4148	45	Bh	3 (1) v (1) 4	8·2
30	4150	25	Bn	3+2	7·8
30	4150	75	Lp	=4	8·3
30	4150	50	Ma	1 (3) v (1) 4, 4+4	7·9*b*
31	4151	45	Bh	4+1	8·2*b*

(6449) T DRACONIS. (V. 3.)

H.D. 175458a.

There is no star of 12^m·4 at the position of the H.C.O. t (−11^s, −10′·7), but there is a star at about −11^s, −0′·3, which has been taken as t, and rated 12^m·8 from independent estimates by Phillips, Steavenson, and van der Bilt.

Date.	Julian Date.	Inst.	Observer.	Comparisons.	Deduced Mag.
1922 Apr					
21	3166	80	Ca	38−3, 40+1	11·3*b*
May					
18	3193	,,	,,	38−2, 40+2	11·2*b*
July					
12	3248	32	,,	=26	10·2
1923 July					
26	3627	OG	Ph	=42	12·0*b*
Aug					
4	3636	,,	,,	=42	12·0*b*
10	3642	,,	,,	42+4	11·6*b*
Sept					
6	3669	,,	,,	40 (1) v (1) 41, 42+5	11·5
9	3672	150	Lp	=40	11·4*c*
10	3673	OG	Ph	40+2	11·2*b*
16	3679	150	Lp	=41	11·7*b*
Oct					
4	3697	,,	,,	=43	12·3*b*
1924 Jan					
11	3796	94	Bl	=42	12·0
Feb					
14	3830	,,	,,	=41	11·7
23	3839	215	Ha	42 (1) v (4) 44	12·0
28	3844	94	Bl	=42	12·0
Mar					
9	3854	,,	,,	42 (1) v (4) 43, =42	12·0
30	3875	,,	,,	44−4, t−1	12·8
Apr					
7	3883	OG	Ph	43−1	12·4
17	3893	94	Bl	<43	<12·3

Date.	Julian Date.	Inst.	Observer.	Comparisons.	Deduced Mag.
1924 May					
5	3911	215	Ha	44−1	12·4
5	3911	M	Ph	43−1·5, =44	12·4
13	3919	94	Bl	Estimated	<12·5
25	3931	M	Ph	=44	12·3
27	3933	94	Bl	=t	12·8*b*
June					
5	3942	,,	,,	44−3, =t	12·7
8	3945	172	Ha	44−2	12·5
8	3945	M	Ph	=44	12·3*b*
15	3952	,,	,,	<42	<12·0*b*
19	3956	,,	,,	42 (1) v (1) 44, =43	12·2
23	3960	,,	,,	43−1, =44	12·4
29	3966	94	Bl	=44	12·3
30	3967	M	Ph	43−1, 44−1	12·4
July					
4	3971	,,	,,	=43, =44	12·3*b*
4	3971	172	Ha	43−2	12·5
6	3973	M	Ph	=t	12·8*b*
10	3977	94	Bl	42 (1) v (1) 44	12·2*b*
13	3980	M	Ph	44−2, =t	12·7
24	3991	172	Ha	44−1	12·4
26	3993	94	Bl	42 (4) v (1) 44	12·3
29	3996	M	Ph	43−2·5, 44 (1) v (1) t	12·6
Aug					
7	4005	,,	,,	=44	12·3*b*
9	4007	94	Bl	42 (3) v (1) 44	12·2
19	4017	172	Ha	44−1	12·4
27	4025	,,	,,	44−1	12·4

June 15, Invisible.

(6449) T DRACONIS—*continued.*

Date.	Julian Date.	Inst.	Observer.	Comparisons.	Deduced Mag.
1924 Sept 6	4035	94	Bl	42 (1) v (3) 44	12·1
22	4051	,,	,,	=42	12·0
27	4056	172	Ha	41 (1) v (4) 42	11·7
29	4058	94	Bl	40 (2) v (3) 41	11·5
Oct 1	4060	172	Ha	35 (4) v (1) 41	11·5
14	4073	,,	,,	40 (1) v (2) 41	11·5
23	4082	,,	,,	40 (1) v (1) 41	11·5*b*
1924 Nov 3	4093	94	Bl	=35	
Dec 5	4125	172	Ha	35 (4) v (1) 40	
14	4134	,,	,,	28 (2) v (3) 35	
22	4142	94	Bl	28 (3·5) v (1·5) 35	
26	4146	172	Ha	35 (3) v (2) 40	

(2528) R GEMINORUM. (V. 1.)

H.D. 070122a.

Star A = B.D. + 23° 1605, 9^{m}·49, **H.A., 54,** 80.
Hagen's 3 = TW Geminorum, and Hagen's 44 = Z Geminorum (doubtfully variable).

Date.	Julian Date.	Inst.	Observer.	Comparisons.	Deduced Mag.
1920 Jan 1	2325	90	Bh	2+3	7·1
5	2329	45	,,	2+2	7·2*b*
8	2332	55	Bg	4−1, 3+2	8·0
8	2332	62	Th	=3	8·3
13	2337	90	Bh	2−6, 4−3, =3	8·2*b*
14	2338	30	D	6−1, 8+1	8·9
15	2339	90	Bh	=3	8·3
15	2339	45	Br	4−2, 3+2	8·1
15	2339	62	Th	3 (1) v (1) 5	8·4
15	2339	90	Wh	=3	8·3
19	2343	75	Bn	5−0·5	8·7
19	2343	30	D	8−2, 11+1	9·2
21	2345	55	Bg	3−5, 5−1·5, 6+1	8·8
21	2345	90	Bh	3−1, 5+2	8·4
21	2345	60	Ga	9−3, =13	9·6
23	2347	30	D	8−3, 11+1	9·3
24	2348	62	Th	=6	8·9
24	2348	45	Bh	3−2, 5+1	8·5
24	2348	50	Bn	5 (2) v (1) 6	8·8
26	2350	45	Br	3−3, 6+3	8·6
27	2351	90	Bh	=5	8·6
31	2355	55	Bg	8−3, =9	9·3
31	2355	62	Th	=5	8·6
Feb 4	2359	90	Bh	=5, =6	8·8*b*
6	2361	60	Ga	9−5, =13	9·7
6	2361	55	Bg	9−2, 12+1	9·5*b*
7	2362	160	Br	6−2, 9+1	9·1
8	2363	30	D	11−4, 16+3	9·8
8	2363	157	Th	9−1	9·4
10	2365	90	Bh	5−5, 6−3, =9	9·2
13	2368	,,	,,	=9	9·3
14	2369	55	Bg	=15, =16	10·0
16	2371	60	D	11−5, 16+1	9·9
17	2372	90	Bh	6−5, 9−2, =11	9·4*b*
1920 Feb 18	2373	55	Bg	12−3, 16+1	
18	2373	183	Ma	A (1) v (1) 16	
19	2374	79	,,	19+1	
21	2376	50	,,	16+2	
21	2376	160	Br	=19	
23	2378	90	Bh	9−3, =11, 19+6	
23	2378	79	Ma	6−5, A (1) v (1) 16	
24	2379	50	,,	19 (1) v (1) 22	
24	2379	55	Bg	16−1, 19+2	
26	2381	50	Ma	=16	
27	2382	90	Bh	=16	
28	2383	,,	Wh	19+3	
Mar 4	2388	55	Bg	19−3, 22+2	
7	2391	90	Bh	=19	
8	2392	,,	,,	19+1	
8	2392	50	Ma	19 (1) v (1) 36, =16	
8	2392	,,	Bn	19 (1) v (3) 24	
9	2393	62	Th	=19	
11	2395	160	Br	15−2·5, 24+5	
11	2395	90	Bh	19−2, 22+2	
11	2395	79	Ma	16−1·5	
12	2396	120	Bn	19 (1) v (2) 23	
12	2396	55	Bg	19−4, 22+1	
13	2397	79	Ma	16 (1) v (1) 23	
15	2399	,,	,,	16 (3) v (1) 23	
15	2399	60	D	16−6, 22+2	
17	2401	90	Bh	15−6, 19−3, 22+1, 28+6	
18	2402	120	Bn	19−3, 23+1	
19	2403	79	Ma	=23	
20	2404	75	Bg	22−3, 28+2	
22	2406	120	Bn	19 (5) v (1) 23	
22	2406	90	Bh	=22, =24	
23	2407	79	Ma	=23	
23	2407	75	Bg	=28	

Jan. 21, Feb. 6, Ga, t.
Feb. 6, Bg, Red.

Mar. 8, Ma, About.

(2528) R GEMINORUM—*continued.*

1920 Mar					
31	2415	90	Bh	24−2, 28+2	11·0
Apr					
6	2421	60	D	=29	11·3*b*
10	2425	90	Bh	28−5, 31−2	11·7*b*
12	2427	,,	,,	=38, =39, 40+1	12·0
13	2428	79	Ma	31+1, 40+3	11·6
16	2431	,,	,,	40+1	11·9*c*
16	2431	160	Br	28−1, 31+1	11·4
16	2431	157	Th	31−1, 40+3	11·7
17	2432	90	Wh	31−2	11·7
17	2432	,,	Bh	=40, 49+5	12·0*b*
19	2434	183	Ma	31 (1) v (4) 40	11·6
21	2436	90	Bh	40−2, 49+2	12·3*b*
21	2436	157	Th	31−2	11·7*b*
28	2443	90	Bh	40−5	12·5*b*
29	2444	160	Br	31−2, 40+3	11·7
30	2445	157	Th	=39, =40	12·0*b*
May					
4	2449	,,	,,	40−5	12·5*c*
4	2449	90	Bh	40−5, 38−5	12·5*b*
7	2452	150	Bn	40+1	11·9
9	2454	240	Br	39−2, 40−2	12·2
13	2458	120	Bn	<28	<11·3
Aug					
18	2555	90	Bh	19−2, 22+3	10·5
26	2563	75	Bn	19−2, 23+4	10·4*b*
29	2566	90	Bh	9−2, =11	9·4
Sept					
4	2572	,,	,,	6−5, =9	9·3
10	2578	,,	,,	6−2, 10+2	9·1
12	2580	45	Bh	6−1, 9+3	9·0*b*
12	2580	75	Bn	=6	8·9
16	2584	90	Bh	=3	8·3
19	2587	48	Bg	2−3, 4+2	7·7*b*
22	2590	45	Bh	4+2, 3+5	7·7
Oct					
1	2599	,,	,,	=2	7·4*b*
2	2600	,,	,,	2+4	7·0
6	2604	,,	,,	2+2	7·2
7	2605	30	D	2+2·5	7·2*b*
9	2607	90	Bh	2+5, 4+10	6·9
12	2610	,,	,,	2+5	6·9
18	2616	45	,,	2+4	7·0
18	2616	,,	Br	2+5	6·9*b*
18	2616	30	D	2+3	7·1*b*
22	2620	45	Bh	2+4	7·0
25	2623	,,	,,	2+6	6·8*b*
25	2623	50	Bn	=2	7·4
29	2627	45	Br	2+5	6·9*b*
29	2627	,,	Bh	2+5	6·9
Nov					
1	2630	,,	,,	2+5	6·9
5	2634	,,	,,	2+5	6·9
7	2636	50	Bn	2+1	7·3
8	2637	30	D	=2	7·4*b*
8	2637	45	Bh	2+2	7·2
11	2640	,,	,,	=2	7·4
11	2640	,,	Br	2−3	7·7
15	2644	,,	Bh	2+2	7·2
16	2645	B	Bg	e−2, f+1	7·0*b*
18	2647	30	D	2−1, 4+5	7·5
18	2647	60	Co	=2	7·4

April 6, About.
May 13, Not seen.
Oct. 6, Orange.
Oct. 18, 29, Br, About.

1920 Nov					
19	2648	55	Bg	2−2, 4+3, 3+6	7·6*b*
20	2649	45	Bh	=2	7·4
21	2650	50	Bn	2+1·5	7·3
23	2652	25	,,	2+1	7·3
24	2653	60	Co	=2	7·4
30	2659	45	Bh	2−2	7·6
Dec					
1	2660	60	Co	2−2, 4+3	7·6
3	2662	55	Bg	2−4, 4+1	7·8
7	2666	45	Bh	2−3, 4+2, 3+5	7·7
9	2668	,,	Br	=4	7·9
9	2668	50	Bn	2 (4) v (1) 4	7·8
10	2669	60	Co	=4, 3+2	8·0
12	2671	90	Bh	=4, 3+3	7·9
14	2673	60	Co	=4, 3+1·5	8·0
17	2676	90	Bh	4+1	7·8
21	2680	,,	,,	4+1	7·8
21	2680	80	Co	3−2, 5+2	8·4*b*
22	2681	,,	,,	3−3	8·6*b*
28	2687	,,	,,	3−2, 5+2	8·4
28	2687	90	Bh	4−5, =3	8·3
28	2687	55	Bg	4−1, 3+2	8·0
31	2690	80	Co	3−2·5, 5+1	8·5
31	2690	45	Br	4−1	8·0
31	2690	75	Bn	5 (1) v (2) 6	8·7*b*
31	2690	90	Bh	3−1, 5+3	8·3
1921 Jan					
1	2691	32	Ca	5−2, 6+1	8·8
2	2692	80	Co	3−4, =5, 6+3	8·6
5	2695	,,	,,	3−4, =5, 6+3	8·6
6	2696	90	Bh	3−4, =5	8·6
7	2697	48	Wi	9−1	9·4
9	2699	,,	,,	6−5, 9−1	9·4
9	2699	80	Co	=5, 6+3	8·6
10	2700	,,	,,	5−2, 6+1·5	8·8
12	2702	,,	,,	5−3, =6	8·9
12	2702	48	Wi	9−3, 11−1	9·5
13	2703	90	Bh	6−2, 9+3	9·0
14	2704	45	Br	4−4, 6+4	8·4
15	2705	75	Bn	6+1	8·8
15	2705	90	Bh	6−2, 9+2	9·1*b*
15	2705	79	Ma	=9	9·3
15	2705	48	Wi	=9	9·3
15	2705	80	Co	=6, 9+4	8·9
18	2708	,,	,,	6−2, 9+2	9·1
18	2708	48	Wi	9−2, 13+3	9·4
24	2714	90	Bh	6−4, 9+1	9·2
28	2718	32	Ca	6−3, 9+1	9·2
30	2720	80	Co	9−1	9·4*b*
31	2721	55	Bg	12−3	9·9*b*
31	2721	48	Wi	16−1, 19+2	10·1
Feb					
1	2722	50	Bn	9 (2) v (1) 11	9·4
2	2723	90	Bh	=9	9·3
3	2724	60	Co	9−2·5, 13+1	9·5
3	2724	160	Br	9−2	9·5
4	2725	79	Ma	A (3) v (2) 16, 19+2	9·9
9	2730	50	,,	A (1) v (2) 16, 19+1	9·8*b*
9	2730	45	Bh	9−2, 11−1	9·5
9	2730	60	Co	=13	9·7

Nov. 24, Dec. 10, 14, Orange.
Dec. 31, Br, Rather Orange.
Jan. 15, Ma, Dull red.
Jan. 30, About.
Feb. 9, Ma, Reddish.

(2528) R GEMINORUM—*continued.*

1921					
Feb					
14	2735	50	Ma	=A	9·5
17	2738	90	Bh	9−1, =11	9·4
17	2738	60	Co	=13	9·7*b*
20	2741	,,	,,	=14	9·8*c*
20	2741	90	Bh	9−4, 11−1	9·6*b*
21	2742	50	Bn	12 (1) v (2) 16	9·8
22	2743	48	Wi	16−6, 19−3	10·6
24	2745	55	Bg	19−1, 22+4	10·4
25	2746	160	Br	=19	10·3
25	2746	90	Bh	9−5, 19+4	9·8
25	2746	60	Co	16−1, 19+1	10·2
26	2747	,,	,,	=19	10·3*b*
27	2748	50	Ma	8 (3) v (2) 16, 16+2	9·7
Mar					
1	2750	,,	Bn	12 (4) v (1) 16	10·0
2	2751	55	Bg	19−2, 22+3	10·5
2	2751	90	Bh	19−2, =21	10·5
2	2751	60	Co	=19	10·3
2	2751	50	Ma	16+1	9·9
2	2751	48	Wi	16−5, 22+3	10·5
5	2754	96	Gr	19−6, 31+6	10·9
7	2756	90	Bh	22+1	10·7
9	2758	55	Bg	19−1, 22+4	10·4
10	2759	48	Wi	19−3, 22+2	10·6
10	2759	50	Bn	20−1	10·5*b*
10	2759	90	Bh	19−4, =22, =24	10·7
14	2763	50	Ma	16−2, 24+4	10·3
16	2765	90	Bh	22−2	11·0*b*
20	2769	79	Ma	23 (1) v (1) 29	11·1*b*
20	2769	160	Br	19−3, 22+2	10·6
21	2770	45	Bh	24+1	10·7
24	2773	90	,,	22−1, 24+2	10·7
24	2773	79	Ma	23+1	10·7
24	2773	50	Bn	19 (4) v (1) 23	10·7
24	2773	75	Bg	22−3, 28+2	11·1
24	2773	48	Wi	24+2, 28+6	10·6
26	2775	,,	,,	24−3, 28+2	11·1
26	2775	79	Ma	=23	10·8
29	2778	90	Bh	=22, =24	10·8
30	2779	79	Ma	23−0·5	10·8*b*
30	2779	48	Wi	24−2, 28+3	11·0
31	2780	75	Bg	22−2·5, 28+2·5	11·0
31	2780	120	Bn	28 (1) v (2) 31	11·3
Apr					
1	2781	90	Bh	=24	10·8
2	2782	160	Br	22−3, 28+3	11·0
3	2783	60	D	<29	<11·3
3	2783	79	Ma	23−2, 41+2	11·4
6	2786	75	Bn	19 (3) v (1) 23	10·7
7	2787	,,	Bg	=28	11·3
7	2787	90	Bh	24−2	11·0
7	2787	48	Wi	24−4, 28+1	11·2
8	2788	79	Ma	32+1	11·6
10	2790	,,	,,	23−6, 33+6, 40+8	11·2
10	2790	48	Wi	24−5, 33+4	11·3
12	2792	90	Bh	24−4	11·2
15	2795	,,	,,	24−5, 32+2	11·4
23	2803	,,	,,	40+1	11·9*b*
1921					
Apr					
23	2803	48	Wi	<29	<11·3
27	2807	120	Bn	31 (2) v (1) 39	11·8
27	2807	90	Bh	31−3, =35, 40+1	11·9
28	2808	75	Bg	28−4, 40+3	11·7
28	2808	120	Br	=31	11·5
30	2810	90	Bh	=40	12·0
May					
1	2811	48	Wi	<31	<11·5
1	2811	120	Bn	31 (2) v (1) 39, 40+2	11·8
7	2817	90	Bh	40−3, 49+3	12·3
8	2818	160	Br	31−2, 39+2	11·8
8	2818	120	Bn	31 (3) v (1) 39, 40+1	11·9
Aug					
19	2921	45	Bh	=15, =16	10·0
30	2932	90	,,	9−4, 11−2	9·6
Sept					
5	2938	75	Bn	=11	9·4
6	2939	90	Bh	6−2, 9+2	9·1
6	2939	32	Ca	6−2, 9+2	9·1
7	2940	75	Bn	11+0·5	9·3
16	2949	90	Bh	5+1, 6+3	8·6
24	2957	,,	,,	3+1, 5+5	8·1
27	2960	50	Bn	2 (2) v (1) 4	7·8
30	2963	30	D	2−2, 4+4	7·6
30	2963	90	Bh	4+1, 3+5	7·8
Oct					
5	2968	45	,,	2+2	7·2
5	2968	80	Co	=2, 4+4	7·5
5	2968	30	D	2−2, 4+4	7·6
6	2969	50	Bn	2+1	7·3
8	2971	80	Co	2+2	7·2
8	2971	45	Bh	2+3	7·1
9	2972	32	Ca	f−3, 4+5	7·4
14	2977	45	Br	2+5	6·9
16	2979	30	Bg	1−7, 2+8	6·7
17	2980	45	Bh	2+5	6·9
23	2986	,,	,,	2+5	6·9
27	2990	,,	,,	2+5	6·9
31	2994	,,	,,	2+5	6·9
31	2994	32	Ca	e−2, f+1	7·0
Nov					
6	3000	45	Br	2+5	6·9
6	3000	30	Bn	2+2	7·2
7	3001	45	Bh	2+5	6·9
12	3006	,,	,,	2+5	6·9
12	3006	50	Bn	2−0·5	7·5
17	3011	45	Bh	2+5	6·9
21	3015	32	Ca	f−1, 4+7	7·2
23	3017	45	Bh	2+5	6·9
23	3017	55	Bg	2−1, 4+4	7·3
24	3018	30	D	2+1·5	7·3
24	3018	80	Co	2+2	7·2
26	3020	,,	,,	2+1	7·3
26	3020	50	Bn	2 (1) v (3) 4	7·6
27	3021	80	Co	2+1	7·3
28	3022	48	Wi	4+6	7·3
29	3023	45	Bh	2+5	6·9
Dec					
3	3027	,,	,,	2+5	6·9

Feb. 14, About.
Feb. 17, 20, Co, About.
Feb. 27, Reddish.
Mar. 5, With 50, =19.
Mar. 26, Ma, About.
Mar. 30, Ma, Rather difficult. Dull red.
April 3, D, Difficult.
April 10, Ma, Very difficult.

April 23, May 1, Wi, Not seen.
Oct. 8, Co, Orange. Bh, Yellow.
Oct. 17, 23, Nov. 28, Orange.
Nov. 6, Br, About.
Nov. 24, Co, Orange.
Nov. 26, Co, Deep orange.
Nov. 27, Rich orange.

(2528) R GEMINORUM—*continued.*

1921 Dec.					
3	3027	45	Br	2+2	7·2
4	3028	80	Co	=2, 4+4	7·5
11	3035	,,	,,	4+4	7·5*b*
13	3037	,,	,,	=2	7·4*b*
15	3039	45	Bh	2+3	7·1
17	3041	80	Co	2−1, 4+4	7·5
20	3044	,,	,,	2−1, 4+3	7·6*b*
20	3044	48	Wi	4+3, 6+13	7·6
21	3045	45	Bh	2+1	7·3
22	3046	80	Co	4+2	7·7
22	3046	37	Li	2 (1) v (9) 3	7·5
22	3046	30	Bg	2−3, 4+2	7·7
23	3047	45	Br	2+1	7·3
25	3049	30	Bn	2 (2) v (1) 4	7·8
25	3049	80	Co	4, 3+3	7·9
28	3052	,,	,,	4+2	7·7*b*
28	3052	37	Li	1 (9) v (1) 2	7·3
29	3053	55	Bg	2 4, 4+1	7·8
29	3053	80	Co	4+1, 3+3	7·9
30	3054	,,	,,	4, 3+2	8·0
30	3054	37	Li	2 (1) v (9) 3	7·5
30	3054	45	Bh	2−3, 4+2	7·7
31	3055	30	Bn	4 (5) v (1) 3	8·2
1922 Jan					
1	3056	45	Bh	2−7, 3+1, 5+5	8·1
3	3058	,,	Br	2−3, 3+5	7·7
3	3058	80	Co	4−1, 3+1	8·1
3	3058	27	Li	2 (5) v (5) 3	7·8
4	3059	90	Wh	=5	8·6
4	3059	30	D	4−1, 3+4	7·9*b*
8	3063	90	Bh	3−1, 5+3	8·3
10	3065	,,	,,	3+1	8·2
10	3065	48	Wi	4−5, 6+5	8·4
16	3071	30	Bg	=4, 3+2	8·0
17	3072	80	Co	3−2, 5+1	8·5*b*
18	3073	90	Bh	3−1, 5+2	8·4
20	3075	,,	,,	3−2, 5+2	8·4
20	3075	55	Bg	4−1, 3+2	8·0
20	3075	75	Bn	4+1	7·8*b*
20	3075	27	Li	2 (5) v (5) 5, =3	8·1
28	3083	80	Co	=5, 6+2	8·7
29	3084	45	Bh	=5	8·6
Feb					
1	3087	55	Bg	3−4·5, 6+1·5	8·7
1	3087	80	Co	6+1, 9+4	8·8
1	3087	30	D	8−1, 11+3	9·1
1	3087	90	Wh	=9	9·3
2	3088	,,	Bh	=5, 6+2	8·7
4	3090	80	Co	6−2, 9+2	9·1*b*
4	3090	30	D	8−1, 11+3	9·1
4	3090	70	Gr	=6	8·9
5	3091	90	Bh	=5, 6+2	8·7
7	3093	80	Co	6−3, 9+2	9·1*b*
10	3096	,,	,,	6−4, 9+1	9·2
10	3096	90	Bh	5−1, 6+1	8·8
11	3097	80	Co	6−5, =9	9·3
14	3100	,,	,,	=9	9·3
17	3103	160	Br	=6	8·9
17	3103	90	Bh	6−3, =9	9·2
17	3103	27	Li	6 (4) v (6) 11, =9	9·2
17	3103	50	Ma	6−1	9·0
18	3104	80	Co	9−3, =12	9·6*b*
18	3104	75	Bn	6 (2) v (1) 8	9·0
18	3104	55	Bg	9−2, 12+1·5	9·5
18	3104	48	Wi	6−7, 19+7	9·6
19	3105	,,	,,	6−9, 19+5	9·8
19	3105	50	Ma	6−1·5, =A	9·3
20	3106	27	Li	9 (3) v (7) 11	9·3
20	3106	80	Co	12−1·5, =14	9·8
20	3106	45	Bh	=9	9·3
22	3108	32	Ca	14 1, 15+1	9·9
24	3110	50	Ma	6 2·5, A	9·3
26	3112	48	Wi	9 7, 10+3	10·0
26	3112	90	Wh	9−4	9·7
26	3112	27	Li	10 (5) v (5) 11	9·4
26	3112	90	Bh	6−8, 9−4, =12	9·7
26	3112	50	Bn	9 (1) v (1) 11	9·3
27	3113	80	Co	=10	9·4
Mar					
2	3116	,,	,,	15−2, =19	10·3*b*
4	3118	55	Bg	12−3, 16+1	9·9
4	3118	45	Br	=13	9·7
4	3118	90	Bh	6−6, 9−2	9·5
4	3118	30	D	11−4, 16+2	9·8*b*
4	3118	90	Wh	9−4	9·7
4	3118	48	Wi	19−1, 22+4	10·4
9	3123	79	Ma	9 (1) v (2) 19	9·6
10	3124	90	Bh	9−3, 11−3	9·6*b*
14	3128	79	Ma	6−9, 9−7, A (3) v (1) 16	9·9*b*
16	3130	70	Gr	=16	10·0
16	3130	90	Bh	11−5, 19+4	9·9
17	3131	,,	,,	9−8, 19+2	10·1
18	3132	55	Bg	19−1, 22+4	10·4
18	3132	79	Ma	=16	10·0*b*
19	3133	32	Ca	15−2, 19+1	10·2
19	3133	90	Bh	=19	10·3
20	3134	79	Ma	=16	10·0*b*
23	3137	,,	,,	16−1	10·1
25	3139	45	Br	19−2, 22+2	10·5
25	3139	50	Bn	19 (1) v (1) 23	10·5
28	3142	90	Bh	19−3, 22+2	10·6
Apr					
2	3147	75	Bg	19−2, 22+3	10·5
4	3149	45	Bh	=22	10·8
9	3154	90	,,	=22, =24	10·8
10	3155	,,	Wh	26−2	11·3
14	3159	,,	Bh	=22, =24	10·8*b*
15	3160	70	Gr	28−5	11·8
15	3160	80	Ca	=31	11·5
17	3162	79	Ma	23 (1) v (1) 29	11·1
17	3162	90	Bh	24−1	10·9
18	3163	,,	Wh	=31	11·6
19	3164	75	Bn	28 (1) v (1) 31	11·4
19	3164	90	Wi	41+2	11·8*b*
24	3169	33	,,	<29	<11·3
29	3174	120	Br	31+3	11·2
29	3174	90	Bh	28−2	11·5
May					
3	3178	70	Gr	=40	12·0
3	3178	90	Bh	24−6, 28−3	11·5
6	3181	,,	,,	28−3	11·6
12	3187	,,	,,	28−4, =34, =32	11·7

Dec. 4, 13, Orange.
Jan. 4, D, Difficult.
Feb. 17, Li, Slightly orange.
Feb. 20, Li, Very slightly orange.
Feb. 24, Slightly reddish.
Mar. 4, D, Difficult.
Mar. 9, Pale yellow.
April 24, Possibly glimpsed.

(2528) R GEMINORUM—*continued.*

1922					
May					
16	3191	70	Gr	31−2	11·8
17	3192	90	Bh	28−5, 40+2	11·8
Aug					
27	3294	150	Wf	=28, 31+3	11·3
29	3296	80	Ca	=28, 31+3	11·3
Sept					
1	3299	90	Bh	=15	10·0*b*
9	3307	,,	,,	6−2, 9+2	9·1
15	3313	,,	,,	=5, =6	8·8*b*
16	3314	62	Wf	4−1, 3+2	8·0
20	3318	,,	,,	2−2, 4+3	7·6
21	3319	90	Bh	4+1	7·8
23	3321	62	Wf	=2	7·4*b*
26	3324	45	Bh	2+6	6·8
30	3328	,,	,,	2+8	6·6
Oct.					
1	3329	,,	,,	2+7	6·7
7	3335	,,	,,	2+7	6·7
11	3339	,,	,,	2+8	6·6
13	3341	,,	,,	2+8	6·6
14	3342	45	Br	1−6	6·6*b*
15	3343	B	Wf	=d	6·5
18	3346	45	Bh	2+7	6·7
20	3348	B	Ca	d (1) v (3) e	6·6
21	3349	45	Bh	2+5	6·9
25	3353	,,	,,	2+7	6·7
27	3355	,,	,,	2+10	6·4
27	3355	,,	Br	1−1	6·1
27	3355	B	Co	d−2, f+3	6·7*b*
28	3356	34	Li	1 (1) v (9) 2	6·1
Nov					
1	3360	,,	,,	1 (1) v (9) 2	6·1
4	3363	45	Bh	2+10	6·4
6	3365	48	Bg	1−7, 2+7	6·7*b*
6	3365	33	Wi	1−2	6·2
6	3365	32	Ca	d (1) v (3) e	6·6
9	3368	45	Bh	2+10	6·4
10	3369	34	Li	1 (3) v (7) 2	6·4
11	3370	45	Br	1−2	6·2
11	3370	,,	Bh	2+8	6·6
15	3374	B	Co	=d	6·5*b*
15	3374	31	D	1 (2) v (1) 2, 2+5	7·0
15	3374	50	Bn	1−2	6·2
16	3375	32	Ca	d (1) v (2) e	6·6
17	3376	B	Wf	=e	6·8
19	3378	45	Bh	2+5	6·9
24	3383	,,	,,	2+10	6·4*b*
24	3383	55	Bg	1−6, 2+9	6·6*b*
24	3383	45	Br	1−2	6·2
24	3383	F	Bn	e (2) v (1) f	7·0
27	3386	30	Co	1 (2) v (2) 2	6·7
28	3387	90	Bh	4+10	6·9
Dec					
5	3394	45	,,	2+6	6·8
6	3395	,,	,,	2+5, 4+10	6·9
8	3397	50	Bn	f (1) v (3) 2	7·2
11	3400	34	Li	1 (4) v (6) 2	6·6
11	3400	45	Bh	2+4, 4+8	7·1
12	3401	32	Ca	e (1) v (2) f	6·9
1922					
Dec					
16	3405	45	Bh	2+2, 4+8	7·2
18	3407	,,	,,	2+2	7·2
19	3408	,,	Br	2−1	7·5
19	3408	30	Co	=2	7·4
19	3408	34	Li	1 (8) v (2) 2	7·1*b*
19	3408	33	Wi	4+6	7·3
20	3409	31	D	2+2	7·2*b*
22	3411	34	Li	1 (9) v (1) 2	7·3
22	3411	30	Co	2−3	7·7
22	3411	,,	Bg	2−3, 4+2	7·7*b*
24	3413	,,	Bn	2 (1) v (2) 4	7·6
24	3413	75	Pr	4+5	7·4*b*
25	3414	90	Bh	4+5	7·4
26	3415	30	Co	2−2	7·6
26	3415	44	Wi	2−2	7·6
28	3417	90	Bh	2+1, 4+5	7·4
1923					
Jan					
4	3424	45	,,	=2	7·4
6	3426	34	Li	2 (2) v (8) 3	7·6
6	3426	44	Wi	4+1, 3+3	7·9
8	3428	,,	,,	4+2, 3+5	7·7
8	3428	75	Pr	4+5	7·4
9	3429	32	Ca	g (1) v (2) 4	7·7
10	3430	44	Wi	4+5, 3+6	7·6
10	3430	55	Bg	2−4, 4+1	7·8
11	3431	45	Bh	2−2, 4+3	7·6
13	3433	62	Wf	4 (1) v (1) 3	8·1
14	3434	75	Pr	4+5	7·4
14	3434	34	Li	2 (4) v (6) 3	7·8
14	3434	90	Bh	4+1	7·8
15	3435	55	Bg	2−4, 4+1	7·8
15	3435	30	Bn	2 (4) v (1) 3	8·1
20	3440	45	Br	4+1	7·8
20	3440	,,	Bh	2−2, 4+2	7·7
20	3440	34	Li	2 (6) v (4) 3	7·9
21	3441	32	Ca	4 (3) v (1) 3	8·2
22	3442	55	Bg	=4	7·9
23	3443	62	Wf	4−1, 3+2	8·0
24	3444	34	Li	2 (9) v (1) 3	8·2
27	3447	90	Bh	=4	7·9
Feb					
3	3454	,,	,,	4−2, 3+2	8·1
4	3455	30	Bn	5 (1) v (2) 6	8·7
4	3455	90	Wh	3 (1) v (1) 6	8·6
5	3456	45	Br	6−1, 9+3	9·0
5	3456	34	Li	4 (2) v (8) 5	8·1
7	3458	62	Wf	3−5, 6+2	8·7
8	3459	32	Ca	6 (1) v (3) 9	9·0
8	3459	90	Bh	3−4, =5, 6+2	8·7
9	3460	,,	,,	=5	8·6
11	3462	55	Bg	6−2, =8, 9+2	9·1
11	3462	50	Bn	5 (1) v (2) 6	8·7
16	3467	90	Bh	5−3, 9+3	9·0
18	3469	55	Bg	8−1, 9+2	9·1
21	3472	75	Pr	6+2, 8+4	8·6
21	3472	34	Li	5 (9) v (1) 6	8·8
23	3474	55	Bg	=11	9·4*b*
27	3478	90	Bh	=9	9·3
Mar					
2	3481	,,	,,	9−1, =11	9·4

Sept. 23, With B, 7·6.
Oct. 14, About.
Oct. 27, Nov. 15, Co, Difficult.
Nov. 1, Light orange.
Nov. 6, Bg, 8c. Wi, Difficult owing to colour.
Nov. 24, Bg, 8c.

Dec. 19, Co, Ruddy.
Dec. 20, Difficult.
Dec. 22, Co, Dull orange.
Dec. 24, Pr, Deep orange.
Jan. 8, Pr, Orange.

(2528) R GEMINORUM—*continued.*

1923					
Mar					
3	3482	55	Bg	12−3, 16+1	9·9*b*
4	3483	79	Ma	A (3) v (1) 16	9·9*b*
5	3484	90	Wh	=9	9·3
5	3484	34	Li	9 (5) v (5) 10	9·3
6	3485	79	Ma	16+1	9·9*b*
8	3487	90	Bh	11−6, 19+4	9·9
13	3492	,,	,,	19+1	10·2
16	3495	32	Ca	16 (4) v (3) 22	10·4
17	3496	75	Bg	12−4, =16, 19+2	10·1
17	3496	50	Bn	23 (1) v (2) 25	10·8
17	3496	90	Bh	=21	10·5
18	3497	34	Li	14 (4) v (6) 15	9·9
18	3497	79	Ma	16−1	10·1
21	3500	90	Bh	19−5, 22+1	10·7
24	3503	94	Li	19 (3) v (7) 22	10·4
24	3503	120	Wi	=24	10·8
26	3504	90	Wh	=28	11·3
25	3504	,,	Bh	=22, =24	10·8
31	3510	79	Ma	16 (2) v (1) 23	10·5
31	3510	75	Pr	12−4, =16	10·0*b*
Apr					
4	3514	120	Bn	28 (3) v (2) 31	11·4
4	3514	75	Bg	22−3, 28+1	11·1*b*
8	3518	55	Bg	28−1·5, 31+1·5	11·4
8	3518	90	Bh	31−1, =33	11·7
8	3518	193	Li	28 (5) v (5) 31	11·4
8	3518	79	Ma	23 (1) v (2) 32	11·4
8	3518	75	Pr	=29	11·3*b*
8	3518	90	Wh	=31	11·5
13	3523	,,	Bh	34−1, =33	11·7
14	3524	75	Bg	28−2, 31+1	11·4
14	3524	,,	Bn	28 (3) v (1) 31, 31+0·5	11·4
14	3524	79	Ma	32+2, 40+5, 41+2	11·6
15	3525	120	D	31−2	11·7*b*
15	3525	157	Wf	=31, 40+3	11·6
17	3527	90	Bh	=40, 43+2	12·0
18	3528	50	Gr	32 (2) v (3) 40	11·8*b*
19	3529	193	Li	31 (4) v (6) 33	11·6*b*
20	3530	130	Ma	31+2, 40+4	11·5
20	3530	75	Pr	31−2, 39+1	11·8*b*
20	3530	120	Bn	=31	11·5
20	3530	160	Br	=31	11·5
20	3530	75	Bg	28 (4) v (1) 31	11·5
22	3532	90	Bh	=43	12·2
29	3539	,,	,,	43−3, =49	12·5
May					
3	3543	,,	,,	=43, =49	12·4*b*
3	3543	,,	Wh	=49	12·5
5	3545	100	Bg	=40	12·0*b*
5	3545	120	Bn	31 (3) v (1) 39, 41+1	11·9
5	3545	75	Pr	=39, =40	12·0*b*
7	3547	157	Wf	31−4, =40	12·0
9	3549	120	Br	31−2, 40+2	11·8
11	3551	90	Bh	49−1, 54+2	12·6
20	3560	157	Wf	39−3	12·3*c*
Aug					
15	3647	90	Bh	=49	12·5
17	3649	150	Wf	<40	<12·0*b*
22	3654	90	Bh	39−1, 40−1, 49+3	12·1
30	3662	,,	,,	22−10, 40+2	11·8

1923					
Sept					
5	3668	157	Wf	31−3, 40+2	11·8
7	3670	150	,,	=31, 33+2	11·5
7	3670	90	Bh	22−3, =26, 28+2	11·1*b*
9	3672	,,	,,	=22, =23, =24	10·8
10	3673	,,	,,	22 (1) v (2) 31, =26	11·0
11	3674	120	Bn	24 (3) v (1) 28	11·1
14	3677	80	Ry	19−4, 24+4	10·5*b*
15	3678	62	Wf	19−3, 24+3	10·5
15	3678	90	Bh	=19	10·3
18	3681	,,	,,	14−3, 19+2	10·1*b*
19	3682	50	Ry	13−4, 15−1·5, 16−1, =19, 24+5	10·2
23	3686	,,	Bn	12−2	9·8*b*
26	3689	20	Ry	8−5, 9−5, 11−1·5, =13, 15+3	9·6
26	3689	90	Bh	=14, 19+5	9·8
30	3693	50	Ry	11−1, 13+1	9·5*b*
Oct					
1	3694	45	Bh	6−8, 9−2	9·6*b*
4	3697	90	,,	6−7, 9−3	9·6
5	3698	30	Ry	6−2, 9−1·5, 11+1·5, 14+2	9·3
6	3699	90	Bh	6−4, 9+1	9·2
9	3702	,,	,,	6−2, 9+2	9·1
9	3702	62	Wf	6−2, 9+2	9·1
11	3704	45	Br	3−3, 6+3	8·6
11	3704	90	Bh	=6	8·9
12	3705	30	Co	3−3, 6+1	8·7
13	3706	32	Ca	5 (2) v (1) 6	8·8
14	3707	50	Bn	3 (2) v (1) 5	8·5
16	3709	,,	Ry	=5, 6+1, 9+3	8·7
17	3710	60	D	3−1, 5+2	8·4
19	3712	90	Wh	=6	8·9
19	3712	,,	Bh	=3	8·3
23	3716	,,	,,	4−2, 3+3	8·0
25	3718	,,	,,	4+2, 3+4	7·8
27	3720	55	Bg	2 (4) v (1) 4	7·8*b*
29	3722	50	Ry	4−1·5, 5+5	8·1
Nov					
1	3725	45	Bh	=2	7·4
3	3727	30	Wi	4−1	8·0
3	3727	,,	Ry	2−4, 4+1, 5+6	7·9
4	3728	45	Bh	2+1	7·3
5	3729	,,	Br	=4	7·9
6	3730	50	Bn	2−4, 4+1	7·8
6	3730	45	Bh	2−1	7·5
7	3731	30	D	2−4, 4+1	7·8
8	3732	32	Ca	2 (3) v (2) 4	7·7
9	3733	45	Bh	2+1	7·3
10	3734	30	D	2−4, 4+1	7·8
11	3735	20	Ry	2−1, 4+4	7·5
12	3736	45	Bh	2+3	7·1
14	3738	30	Co	4+1, 3+4	7·8
16	3740	55	Bg	2 (2) v (3) 4	7·6*b*
17	3741	45	Bh	2+1, 3+5	7·5
17	3741	30	Co	4+1, 3+3	7·9
18	3742	50	Bn	2 (2) v (3) 4	7·6
19	3743	45	Bh	2−2, 4+3	7·6
20	3744	20	Ry	2−1	7·5
23	3747	45	Bh	2−1	7·5
27	3751	,,	,,	=2	7·4

Mar. 31, Pr, Yellow.
April 15, D, Difficult.
April 19, Difficult.
April 20, Bn, t.
May 5, Bg, About. Pr, Difficult.

Sept. 19, T.
Sept. 26, 30, Oct. 5, 16, 29, Ry, T.
Nov. 3, Ry, t. Nov. 7, 6^{p}.
Nov. 11, 2-in. and 3-in. OG's.
Nov. 20, t.

(2528) R GEMINORUM—*continued.*

1923 Nov					
29	3753	30	Ry	2−1	7·5*b*
30	3754	50	Bn	2 (2) v (1) 4	7·8*b*
30	3754	30	Co	=4	7·9
30	3754	,,	D	2−4, 4+1	7·8
30	3754	32	Ca	2 (2) v (3) 4	7·6
Dec					
1	3755	20	Ry	2−1·5	7·6
2	3756	30	Bg	2 (3) v (2) 4	7·7*b*
2	3756	45	Bh	=2, 4+5	7·4
4	3758	,,	,,	=2, 4+5	7·4
8	3762	,,	Br	2−2, 4+3	7·6
9	3763	30	Bg	2 (3) v (2) 4	7·7
9	3763	45	Bh	2−2, 4+3	7·6
9	3763	30	Co	=4	7·9
9	3763	,,	D	2−4, 4+1	7·8
9	3763	20	Ry	2−5, 4+2	7·8
12	3766	62	Wf	2−1, 4+4	7·5
13	3767	32	Ca	2 (3) v (2) 4	7·7
15	3769	50	Bn	2 (3) v (1) 4	7·8
15	3769	30	Co	4+0·5	7·9
16	3770	55	Bg	2 (4) v (1) 4	7·8
16	3770	30	Ry	2−4, 4+2	7·8*b*
18	3772	,,	Co	4−2, 3+3·5	8·0
18	3772	45	Bh	2−4, 4+1	7·8
20	3774	50	Bn	2−4, 4+2	7·8
22	3776	45	Bh	2−3, 4+2	7·7
24	3778	,,	,,	2−4, 4+1	7·8
27	3781	30	Ry	2−3, 4+3	7·7
28	3782	45	Bh	4−1	8·0
28	3782	55	Bg	2 (5) v (1) 4	7·8*b*
28	3782	45	Br	4+4	7·5
28	3782	30	Co	=4, 3+3·5	7·9
30	3784	,,	D	4−1, 3+3	8·0
31	3785	32	Ca	4 (2) v (1) 3	8·1
1924 Jan					
3	3788	45	Bh	4+2	7·7
4	3789	60	Co	4−1, 3+4	7·9
4	3789	20	Ry	2−3, 4+1	7·8
5	3790	30	D	4−3, 3+2	8·1
5	3790	55	Bg	4 (1) v (4) 3	8·0*b*
6	3791	50	Bn	4+1	7·8
6	3791	45	Br	=4	7·9
6	3791	60	Co	4−1, 3+2	8·0
6	3791	44	Wi	4−1, 3+2	8·0
7	3792	30	D	4−3, 3+1	8·2
8	3793	32	Ca	4 (2) v (1) 3	8·1
11	3796	90	Bh	=3	8·3
12	3797	40	D	3−1, 5+3	8·3
14	3799	60	Co	4−3, 3+1	8·2
15	3800	55	Bg	4 (3) v (2) 3	8·1*b*
15	3800	30	D	4−3, 3+1	8·2
16	3801	90	Bh	4−5, 3−2	8·4
17	3802	30	Ry	4−2, 5+4·5, 6+4	8·3
25	3810	50	Bn	=5	8·6
25	3810	45	Br	4−2, 3+2	8·1
25	3810	60	Co	6−0·5, 9+3	9·0
25	3810	90	Bh	=3	8·3
26	3811	45	,,	3−1	8·4
26	3811	32	Ca	3 (1) v (3) 5	8·3
27	3812	55	Bg	3 (3) v (2) 6	8·6
27	3812	30	D	3−1, 5+2	8·4

Nov. 29, Dec. 1, t.
Dec. 9, 16, 27, Jan. 4, 17, Ry, t.
Dec. 30, 6e.

1924 Jan					
27	3812	30	Ry	4−1, 6+1	8·4*b*
31	3816	90	Bh	3 (1) v (2) 5	8·4
Feb					
1	3817	50	Bn	5 (2) v (1) 6	8·8
1	3817	30	D	3−2, 5+1	8·5
1	3817	60	Co	6 (2) v (2) 9	9·1
6	3822	50	Ma	3 (1) v (1) 6	8·6
8	3824	60	Co	=9	9·3*b*
8	3824	30	D	3−2, 5+2	8·4
8	3824	62	Wf	3−2, 5+2	8·4
10	3826	30	Ry	9−1, 11−2	9·5*b*
11	3827	90	Bh	3 (1) v (1) 5	8·4
14	3830	60	D	6−2, 9+1	9·1
18	3834	90	Bh	=5, 6+2	8·7
20	3836	62	Wf	3−4, 6+1	8·7
21	3837	90	Bh	=5, =6	8·8
21	3837	30	Ry	9−2, 11+1	9·4
22	3838	60	Co	9−2, 11−2, =13	9·6
22	3838	50	Bn	9−1	9·4*b*
23	3839	40	D	6−2, 9+1	9·1
24	3840	90	Bh	5−2, 6+1, 9+5	8·8
26	3842	,,	,,	9+1	9·2
26	3842	,,	Wh	=9	9·3
28	3844	160	Br	9−4, 19+6	9·7
29	3845	32	Ca	11 (2) v (1) 12	9·6
29	3845	30	Ry	12−1, 13−2, 15+2	9·8
Mar					
2	3847	90	Bh	9−1	9·4
4	3849	,,	,,	9 (1) v (1) 11	9·3
4	3849	55	Bg	12 (1) v (3) 16	9·7
4	3849	50	Ma	6 (1) v (1) 16	9·5
4	3849	40	D	=9	9·3
4	3849	60	Co	=13	9·7
5	3850	33	Wi	19+1	10·2
7	3852	50	Bn	12 (1) v (2) 16	9·8
8	3853	55	Bg	12 (3) v (1) 16	9·9
8	3853	40	D	11−3, 16+2	9·8
8	3853	50	Ry	14−4, 15−1, =19	10·2
9	3854	90	Bh	9−2, =11, 19+8	9·5
9	3854	33	Wi	19+1	10·2
10	3855	70	,,	9−8, 19+1	10·1
10	3855	90	Wh	=19	10·3
11	3856	33	Wi	19−2	10·5
11	3856	40	D	11−3, 16+2	9·8
11	3856	79	Ma	16+3	9·7
11	3856	50	Bn	12−3, 16+1·5	9·9
12	3857	55	Bg	=16	10·0
14	3859	40	D	11−3, 16+2	9·8*b*
22	3867	90	Bh	19+1, 22+5	10·2
23	3868	80	Ry	19−2·5	10·5
24	3869	55	Bg	19 (1) v (4) 22	10·4
24	3869	120	Wi	19−4, 24+2	10·6
25	3870	32	Ca	16 (4) v (4) 23	10·4
26	3871	90	Bh	=19	10·3
29	3874	,,	,,	19 (1) v (1) 22	10·5
29	3874	79	Ma	16 (4) v (1) 23	10·6
29	3874	50	Bn	=19	10·3
30	3875	60	D	16−6, 23+2	10·6
30	3875	70	Wi	19−8, 31+4	11·1
Apr					
1	3877	90	,,	16−4, 22+4	10·4*b*
1	3877	50	Bn	19 (1) v (1) 23	10·5

Jan. 27, Ry, t.
Feb. 6, Very slightly red.
Feb. 10, 21, 29, Ry, t. Co's obs. in 1924 made with 5¼-in. reflector.
Mar. 8, D, 8e. Ry, T.

(2528) R GEMINORUM—*continued.*

1924					
Apr					
2	3878	90	Bh	19−3, 22+2	10·6
3	3879	50	Ry	22−1·5, 31+5	11·0
4	3880	160	Br	28+2	11·1
5	3881	55	Bg	19 (4) v (1) 22	10·7
5	3881	79	Ma	16−1, 23+3, 29+3, 31+6, 32+4	10·8
5	3881	32	Ca	19 (4) v (1) 23	10·7
5	3881	80	D	23+2	10·6
6	3882	90	Bh	=22	10·8
7	3883	120	Wi	23−3, 29+2	11·1
7	3883	62	Wf	28+1	11·2*b*
7	3883	79	Ma	16 (1) v (1) 23	10·4
7	3883	50	Bn	23 (2) v (1) 25	10·9
8	3884	90	Bh	24−1	10·9
9	3885	79	Ma	=29, 32+2	11·4*b*
16	3892	90	Bh	31+1	11·4*b*
17	3893	80	Ry	=24, 28−1	11·1*b*
20	3896	75	Bg	28 (2) v (1) 31	11·4
24	3900	80	Ry	31−2, 34−2, =33	11·8
26	3902	150	Wf	=32, 43+5	11·7
27	3903	120	Wi	31−1, 39+3	11·7
27	3903	90	Wh	=31	11·5
29	3905	150	Wf	38−1, 40+1	12·0
May					
1	3907	80	Ry	<33	<11·7
5	3911	150	Wf	=38, 40+1	12·0
5	3911	120	Bn	31 (1) v (2) 39	11·7
10	3916	90	Bh	<43	<12·2
11	3917	231	Wf	40+0·5	11·9
20	3926	,,	,,	=39	12·0*b*
23	3929	80	Ry	<31	<11·5
Aug					
9	4007	231	Wf	<54	<12·8
25	4023	157	,,	43−1, 54+5	12·3
Sept					
2	4031	,,	,,	31−1, 39+4	11·6
5	4034	62	,,	31+2, 33+4	11·3
5	4034	90	Bh	40+2	11·8
8	4037	,,	,,	31+1	11·4
12	4041	,,	,,	22−1, 24−1	10·9
15	4044	,,	Ry	15+2, 19+2	10·0
16	4045	45	Bh	=20, =21	10·5
23	4052	,,	,,	=9, =11	9·3*b*
27	4056	35	Ry	4−1·5, 6+2	8·4
27	4056	32	Ca	=3	8·3
27	4056	62	Wf	3−1, 6+4	8·4
29	4058	90	Bh	=4	7·9
Oct					
2	4061	45	,,	2−1	7·5
5	4064	62	Wf	=2, 4+4	7·5*b*
8	4067	20	Ry	2−2·5, 4+4·5	7·6
11	4070	45	Bh	1 (1) v (2) 2	6·5
13	4072	,,	,,	1 (1) v (1) 2	6·7
17	4076	,,	,,	1 (1) v (2) 2	6·5
22	4081	17	Ry	2+1·5	7·3*b*
23	4082	45	Bh	1 (1) v (2) 2	6·5
23	4082	34	Li	1 (7) v (3) 2	7·0*b*

April 3, T.
May 1, 10, 23, Not seen.
May 20, Difficult.
Aug. 9, Either R or 56 seen.
Sept. 15, 16-in. OG.
Oct. 8, t.
Oct. 23, Li, With B, 7·4 (difficult).

1924					
Oct					
23	4082	45	Br	1−5, 2+10	6·5
23	4082	50	Bn	2+3	7·1
25	4084	55	Bg	1 (1) v (1) 2	6·7*b*
27	4086	32	Ca	e (2) v (2) f	7·0
27	4086	45	Bh	1 (1) v (2) 2	6·5
29	4088	17	Ry	e−2	7·0*b*
31	4090	90	Wh	4+3	7·6
31	4090	45	Bh	1 (1) v (2) 2	6·5
Nov					
3	4093	,,	,,	1 (1) v (3) 2	6·3
3	4093	30	D	1 (2) v (1) 2, 2+4	7·0
3	4093	45	Br	1−3	6·3
3	4093	25	Bn	e−1, 2+5	6·9
3	4093	B	Bg	d (1) v (1) e	6·7
3	4093	34	Li	1 (3) v (7) 2	6·4*b*
4	4094	,,	,,	=e	6·8
5	4095	45	Bh	1 (1) v (2) 2	6·5
6	4096	34	Li	d (5) v (5) e	6·7
11	4101	,,	,,	d (5) v (5) e	6·7*b*
11	4101	13	Ry	d−3, e+3	6·7*b*
15	4105	45	Bh	1 (1) v (3) 2	6·3
16	4106	13	Ry	d−3, e+2	6·7*b*
19	4109	45	Bh	1 (1) v (2) 2	6·5
21	4111	32	Ca	d (2) v (1) e	6·7
24	4114	45	Bh	1 (1) v (1) 2	6·7
26	4116	,,	,,	1 (1) v (1) 2	6·7
26	4116	13	Ry	d−2, e+1·5	6·7*b*
27	4117	45	Bh	1 (2) v (1) 2	7·0
30	4120	B	Bg	d (2) v (1) e	6·7
30	4120	90	Wh	1 (2) v (1) 3	7·5
30	4120	30	D	1 (3) v (2) 2, 2+6	6·9
30	4120	34	Li	d (3) v (7) e	6·6
Dec					
1	4121	45	Bh	1 (2) v (1) 2	7·0
3	4123	34	Li	d (3) v (7) e	6·6
4	4124	45	Bh	1 (3) v (1) 2	7·1
6	4126	13	Ry	e−1, 2−0·5	7·2*b*
6	4126	25	Bn	e (1) v (2) f	6·9
9	4129	34	Li	=e	6·8
14	4134	45	Bh	1 (3) v (1) 2	7·1
14	4134	32	Ca	d (2) v (1) e	6·7
14	4134	90	Wh	1)3) v (1) 4	7·4
14	4134	25	Bn	e (3) v (1) f, 2+4	7·0
15	4135	34	Li	e (4) v (6) f	6·9
19	4139	45	Bh	1 (1) v (1) 2	6·7
21	4141	32	Ca	e (2) v (1) f	7·0
22	4142	30	Bg	=2	7·4
22	4142	,,	D	2+1	7·3
22	4142	45	Bh	1 (2) v (1) 2	7·0
24	4144	,,	,,	1 (2) v (1) 2	7·0
25	4145	30	D	=2	7·4
26	4146	45	Bh	=2	7·4
27	4147	20	Ry	=3, 4+3	7·9*b*
28	4148	30	Bg	=2	7·4
28	4148	45	Bh	2+1	7·3
29	4149	,,	,,	=2	7·4
29	4149	30	Ry	2−3·5, 4+2·5	7·7*b*
30	4150	50	Bn	2+1	7·3
30	4150	45	Bh	2−1	7·5
31	4151	,,	,,	2−2	7·6

Nov. 30, D, 6c.
Dec. 27, 29, Ry, t.

(6044) S HERCULIS. (V. 2.)

H.D. 164715.

Date.	Julian Date.	Inst.	Observer.	Comparisons.	Deduced Mag.
1920 Jan					
1	2425	120	Bn	28 + 1	11·8*b*
5	2429	150	Bh	C + 5	12·1
16	2340	90	,,	17−10, C+6	11·9*b*
16	2440	55	Bo	24 (3) v (1) 28	11·9
21	2345	,,	,,	25 (3) v (1) 28	11·9
22	2446	150	Bh	C+8	11·8
26	2350	90	,,	18−1, C+5	12·0
26	2350	55	Bo	23 (1) v (1) 25	11·6
26	2350	120	Bn	18 (3) v (1) 28	11·9
31	2355	,,	,,	18 (1) v (4) 28	11·8
Feb					
1	2356	55	Bo	17 (1) v (3) 18	11·1
5	2360	90	Bh	⩽17	⩽10·9
11	2366	,,	,,	10−9, 18+3	11·5*b*
11	2366	55	Bo	10 (1) v (3) 13	10·6
13	2370	90	Bh	10+2	10·3
16	2371	55	Bo	=11	10·3
17	2372	45	Bh	9−1, 10+2	10·2*b*
17	2372	36	D	m−5, 8+2	9·9
18	2373	23	Bo	7 (9) v (1) 8	9·9
21	2376	90	Wh	8 (2) v (1) 10	10·4
22	2377	55	Bo	7 (3) v (1) 8	9·8
23	2378	90	Bh	6−6, 9+6	9·4
27	2382	23	Bo	7 (3) v (1) 8	9·8
29	2384	45	Bh	6−6, 7−3, 9+8	9·3
Mar					
4	2388	24	Bo	7 (1) v (4) 8	9·1*b*
6	2390	50	Bn	1 (2) v (1) m	9·3
7	2391	45	Bh	6−4, 10+12	9·3
12	2396	90	,,	6−3, 10+12	9·2
12	2396	23	Bo	7 (1) v (1) 8	9·5
17	2401	90	Bh	6−4, 10+12	9·1
18	2402	30	D	1−2, m+1	9·3
19	2403	23	Bo	7 (1) v (3) 8	9·2
19	2403	50	Bn	1 (2) v (1) m	9·2
22	2406	90	Wh	6 (1) v (3) 10	9·2
22	2406	,,	Bh	6−4	9·2
25	2409	,,	,,	6−3, 8+10	9·1
25	2409	50	Bn	6 (4) v (1) 1	9·1
25	2409	55	Bo	7 (1) v (9) 8	9·0
30	2414	23	,,	6 (1) v (1) 7	8·8
31	2415	90	Bh	5−7, 6−1	8·9*b*
Apr					
6	2421	23	Bo	6 (1) v (3) 7	8·8
11	2426	45	Bh	6+2	8·6
13	2428	30	D	6−1, 1+3	8·9
13	2428	75	Bn	6 (1) v (1) 1	9·0*b*
17	2432	90	Wh	6 (1) v (2) 10	9·4
17	2432	,,	Bh	5−4, 6+4	8·5
21	2436	,,	,,	4−2, =5, 6+5	8·3

Jan. 1, t.
Feb. 5, Not seen.
Mar. 4, Doubtful
April 11, 17, Bh, Unsteady.

Date.	Julian Date.	Inst.	Observer.	Comparisons.	Deduced Mag.
1920 Apr					
21	2436	30	Bn	5 (3) v (1) 6	8·7
21	2436	,,	D	5−2, 6+3	8·5
27	2442	45	Bh	3−3, =4, 5+3	8·0
29	2444	30	Bn	5 (3) v (2) 6	8·6
29	2444	90	Wh	=6	8·8
29	2444	62	Th	=4, 5+2	8·1
May					
3	2448	75	Bn	=5	8·3
4	2449	45	Bh	3−3, =4, 5+3	8·0
7	2452	90	,,	3−2, 4+1	7·9
7	2452	30	D	3−3·5, 4+1·5	7·9
7	2452	50	Bn	=4	8·1
9	2454	30	,,	4+1	8·0
9	2454	90	Wh	=5	8·3
9	2454	,,	Bh	3−1, 4+1	7·8
12	2457	,,	,,	3−1, 4+1	7·8
12	2457	30	D	3−2, 4+4	7·7
13	2458	50	Bn	3 (1) v (1) 4	7·8
14	2459	,,	Ma	5+2	8·1
17	2462	90	Bh	2−4, 3+3	7·3
19	2464	50	Ma	4 (1) v (1) 7, 5+2	8·4
19	2464	30	Bn	3 (3) v (2) 4	7·9
21	2466	50	,,	3 (2) v (1) 4	7·9
21	2466	90	Bh	2−3, 3+3	7·3
21	2466	30	D	6−2, 3+2	7·4*b*
22	2467	50	Ma	=4, 5+4	8·0
22	2467	90	Wh	1 (3) v (1) 5	7·8
23	2468	25	Ad	=4	8·1
23	2468	30	Bn	3 (3) v (1) 4	8·0
25	2470	45	Bh	2−3, 3+3	7·3
25	2470	30	D	=3	7·6*b*
29	2474	50	Bn	3 (3) v (1) 4	8·0
June					
1	2477	25	Ad	=4	8·1*b*
1	2477	50	Bn	3 (3) v (2) 4	7·9
2	2478	45	Bh	2−3, 3+3	7·3
3	2479	50	Ma	4+2	7·9
4	2480	90	Bh	2−3, 3+3	7·3
5	2481	30	Bn	3 (3) v (2) 4	7·9
6	2482	25	Ad	4 (1) v (1) 5	8·2
8	2484	50	Bn	3 (4) v (1) 4	8·0
8	2484	90	Bh	2−3, 3+3	7·3
8	2484	30	D	3−3, 4+3	7·8*b*
10	2486	,,	,,	3−3, 4+2	7·9*b*
14	2490	50	Ma	5 (1) v (4) 6	8·4
15	2491	30	D	3−5, 4+1	8·0
15	2491	45	Bh	2−5, −3	7·5
18	2494	,,	,,	2−5, 3−1	7·6
18	2494	50	Bn	5 (1) v (3) 6	8·4
19	2495	25	Ad	5 (1) v (3) 7	8·4
19	2495	30	D	4−1, 5+1	8·2*b*
22	2498	90	Wh	=5	8·3

May 25, June 2, Bh, Yellow.
June 8, D, Difficult.

(6044) S HERCULIS—*continued.*

1920 June					
22	2498	79	Ma	5−2·5	8·6
22	2498	30	D	=5	8·3
23	2499	25	Ad	5 (2) v (1) 7	8·7*b*
23	2499	45	Bh	3−2, 4+3	7·8
29	2505	90	,,	4−2	8·3
30	2506	30	D	5−2, 6+3	8·5*b*
July					
8	2514	,,	,,	5−3, 6+2	8·6*b*
10	2516	90	Bh	4−4, 6+2	8·5
12	2518	30	D	6−0·5, 1+3	8·8
14	2520	50	Bn	1 (1) v (2) m	9·2
14	2520	43	Gi	6−1, =7	8·9
15	2521	90	Bh	5−2, 6+3	8·5*b*
16	2522	30	D	6−1, 1+2	8·9
18	2524	90	Wh	=7	8·9
19	2525	50	Bn	1 (5) v (2) m	9·3
20	2526	30	D	1−2, m+1	9·3
24	2530	43	Gi	7−2·5, 8+4	9·4*b*
24	2530	79	Ma	6 (1) v (1) 10	9·7*b*
24	2530	64	Ad	6 (1) v (1) 9	9·4*b*
26	2532	90	Bh	6−3	9·1
30	2536	,,	,,	6−8, 9+3	9·7
Aug					
1	2538	75	Bn	m (3) v (1) 9	9·9*b*
2	2539	43	Gi	7−3, 8+2	9·5*b*
3	2540	79	Ma	10+5	10·0*c*
5	2542	50	,,	12+2, 17+4	10·3*b*
6	2543	90	Bh	6−9, 10+6	9·8
6	2543	75	Bn	9 (3) v (2) 10	10·3
8	2545	60	D	8+3	9·8*b*
8	2545	90	Wh	=9	10·0
9	2546	50	Ma	=11	10·3*b*
9	2546	75	Bn	9 (1) v (3) 10	10·2
12	2549	43	Gi	=8, 10+2·5	10·2*b*
13	2550	90	Bh	6−12, =9, =8, 10+5	10·0
15	2552	64	Ad	10 (1) v (1) 11	10·4
16	2553	105	Bo	=8	10·1*b*
16	2553	60	D	8+2, 10+6	9·9
19	2556	90	Bh	10+2	10·3
22	2559	150	Ad	=10	10·5*b*
22	2559	79	Ma	=10	10·5
26	2563	120	Bn	10−2	10·7*b*
29	2566	150	Ad	=17	10·9*b*
29	2566	90	Bh	=10	10·5*b*
Sept					
1	2569	,,	,,	10−1	10·6
1	2569	75	Gi	=10	10·5
4	2572	79	Ma	10−4, 13−2	10·9
4	2572	90	Bh	10−2, 17+1	10·7
5	2573	75	Bn	10 (3) v (1) 17	10·8
6	2574	64	Ad	13 (1) v (1) 20	11·0*b*
6	2574	48	Wi	10 (1) v (1) 13	10·6
8	2576	105	Bo	10 (1) v (3) 17	10·6*b*
9	2577	55	,,	14 (1) v (1) 17	10·8
10	2578	85	Bn	17 (1) v (2) 18	11·2
10	2578	64	Ad	10 (2) v (1) 24, =16	11·2
11	2579	48	Wi	13−2	10·8*b*
12	2580	,,	,,	13−3	10·9
12	2580	60	D	10−3·5, 16+2	10·9
12	2580	225	Bo	17 (1) v (3) 18	11·1
13	2581	90	Bh	10−5	11·0
13	2581	,,	Wh	13 (1) v (1) 18	11·2
15	2583	75	Gi	10−2, 13−1	10·7*b*
16	2584	64	Ad	10 (4) v (1) 24	11·4*c*
1920 Sept					
16	2584	120	Bn	17 (3) v (1) 21	11·2
16	2584	48	Wi	10−6, 13−5	11·1
18	2586	,,	,,	16−1	11·2
19	2587	90	Wh	10−3	10·8
19	2587	160	Bo	17 (3) v (1) 18	11·6
19	2587	90	Bh	10−5, 13−5	11·1
27	2595	,,	,,	17−3, 18+6	11·2*b*
29	2597	160	Bo	20 (1) v (3) 18	11·5
Oct					
1	2599	90	Bh	10−8, 17−2, 18+8	11·1*b*
2	2600	48	Wi	=16	11·1
2	2600	120	Bn	=18	11·8
4	2602	55	Bo	20 (1) v (1) 18	11·6
6	2604	90	Bh	17−3, 18+6	11·2
6	2604	120	Bn	18 (1) v (2) 28	11·8
7	2605	117	Gi	21−1, =18	11·6*b*
9	2607	79	Ma	=18	11·8
9	2607	64	Ad	=25	11·7*b*
9	2607	55	Bo	20 (3) v (1) 18	11·7
11	2609	120	Bn	18 (2) v (3) 28	11·8
14	2612	48	Wi	16−2, 20+1	11·3
14	2612	160	Bo	=28	11·9
17	2615	90	Bh	10−10, 17−6, 18+3	11·5
18	2616	150	,,	18+2	11·6
19	2617	160	Bo	18 (1) v (1) 28	11·9
24	2622	120	Bn	18−2, =28	12·0
27	2625	117	Gi	18−1·5	11·9*c*
29	2627	150	Bn	18−3, 28−1, 33+2	12·0
29	2627	90	Bh	17−9, 18+1	11·7
30	2628	130	Bo	28 (1) v (3) 31	12·0
30	2628	48	Wi	=18	11·8
Nov					
1	2630	150	Bn	28 (1) v (3) 33	12·0
1	2630	48	Wi	=18	11·8
14	2643	117	Gi	=18	11·8*b*
15	2644	120	Bn	18 (1) v (1) 28	11·9
16	2645	90	Bh	17−5, 18+4	11·4*b*
17	2646	79	Ma	=18	11·8
21	2650	120	Bn	17 (4) v (1) 18	11·6
30	2659	90	Bh	10−4, =7	10·9*b*
Dec					
3	2662	50	Bn	10−3	10·8*b*
9	2668	150	,,	10−1	10·6*b*
12	2671	90	Bh	6−13, 10+4	10·1
21	2680	,,	,,	5−4, =6, 7+2	8·7
25	2684	,,	,,	5−4, 6+1	8·7
31	2690	,,	,,	5−3, 6+1	8·6
1921					
Jan					
7	2697	,,	,,	5−4, 6−1	8·8
10	2700	,,	,,	5−4, 6−1	8·8
10	2700	75	Bn	6 (2) v (1) 1	9·0
12	2702	55	Bo	5 (3) v (1) 6	8·7
13	2703	75	Bn	6 (1) v (2) 1	8·9
13	2703	90	Bh	5−2, 6+2	8·5
21	2711	75	Gi	5−5, 6+1	8·7
27	2717	45	Bh	4−1, 5+1	8·2
30	2720	,,	,,	4−1, 5+2	8·2
31	2721	50	Bn	5 (3) v (2) 6	8·6
Feb					
1	2722	45	Bh	4−1	8·2
4	2725	55	Bo	3 (3) v (1) 4	8·0
9	2730	45	Bh	3−4, 4+1	8·0
12	2733	,,	,,	=3	7·6
15	2736	47	Gi	4−1, 5+2	8·2
17	2738	50	Bn	4+1	8·0
17	2738	45	Bh	2−3, 3+3	7·3
19	2740	55	Bo	2 (3) v (1) 3	7·4

Aug. 5, Pale red.
Aug. 26, t.

(6044) S HERCULIS—*continued.*

1921					
Feb					
21	2742	45	Bh	1−4, =2	6·9
25	2746	,,	,,	1−5, =2	6·9*b*
27	2748	47	Gi	3−2, 4+2	7·8
Mar					
2	2751	55	Bo	1 (3) v (1) 2	6·8
2	2751	50	Bn	=e	7·2
2	2751	45	Bh	=2	6·9
6	2755	,,	,,	1−3, 3+6	6·9
11	2760	,,	,,	1−5, =2	6·9
14	2763	,,	,,	1−6, =2, 3+6	7·0*b*
14	2763	50	Bn	2−1, e+3	7·0
14	2763	47	Gi	3−1, 4+2	7·8*b*
15	2764	55	Bo	1 (2) v (1) 2	6·8
16	2765	45	Bh	1−3, 2+3, 3+5	6·8
21	2770	,,	,,	1−6, 3+6	7·0
24	2773	,,	,,	1−3, 2+1, 3+5	6·9
26	2775	48	Wi	4+1, 5+3	8·0
29	2778	45	Bh	2−2, 3+4	7·2
30	2779	55	Bo	1 (4) v (1) 2	6·8
30	2779	50	Bn	2 (2) v (1) e	7·1
31	2780	47	Gi	3−3, 4+2	7·9
Apr					
1	2781	45	Bh	=2, 3+3	7·1
3	2783	30	Bn	e (3) v (1) 3	7·5
3	2783	,,	D	e−3, 3+1	7·5*b*
6	2786	,,	Bn	3−1	7·7
7	2787	45	Bh	=2, 3+3	7·1*b*
7	2787	48	Wi	5−3, 7+3	8·6
11	2791	30	D	=3	7·6*b*
12	2792	,,	Bn	3 (2) v (1) 4	7·9
12	2792	45	Bh	=3	7·6
15	2795	30	D	3−2, 4+3	7·8
18	2798	,,	,,	3−2, 4+3	7·8
19	2799	,,	Bn	3 (3) v (1) 4	8·0
22	2802	47	Gi	4−2, 5+1	8·3
23	2803	45	Bh	=3, 4+3	7·7*b*
26	2806	90	,,	3−2, 4+2	7·8
27	2807	50	Bn	5 (2) v (1) 6	8·6
27	2807	30	D	4−1, 5+1	8·2*b*
28	2808	,,	,,	5−2, 6+2	8·5
28	2808	55	Bo	4 (1) v (1) 5	8·2
29	2809	45	Bh	3−2, 4+1	7·9
29	2809	30	D	4−1, 5+1	8·2
May					
1	2811	48	Wi	5−4, 7+2	8·7
1	2811	50	Bn	5 (5) v (2) 6	8·6
5	2815	47	Gi	6−0·5	8·8
7	2817	45	Bh	=4	8·1
8	2818	50	Bn	6+1	8·7
8	2818	48	Wi	5−7, 6−2	9·0
9	2819	45	Bh	4−1, 5+1	8·2*b*
10	2820	55	Bo	5 (3) v (1) 6	8·7
15	2825	50	Bn	1 (1) v (1) m	9·3
16	2826	30	D	6−2, 1+1	9·0*b*
20	2830	55	Bo	7 (1) v (3) 8	9·2
22	2832	48	Wi	7−4, 8+9	9·2
22	2832	50	Bn	1 (2) v (1) m	9·3
23	2833	45	Bh	5−2, 6+2	8·5
29	2839	30	D	m−5, 8+3	9·8
30	2840	75	Gi	7−8, m−1, 8+5	9·6*b*
June					
1	2842	55	Bo	7 (2) v (1) 8	9·7
2	2843	90	Bh	6−8, 9+3	9·7
1921					
June					
6	2847	60	D	m−4, 8+3	9·8*b*
6	2847	48	Wi	9+1, 10+6	9·9*b*
7	2848	64	Ad	11 (1) v (2) 10	10·3
7	2848	50	Bn	m (5) v (2) 9	9·9
9	2850	48	Wi	10+1, 13+2	10·4
10	2851	90	Bh	10+4	10·1
11	2852	64	Ad	9 (1) v (1) 10	10·3
11	2852	120	Bn	9+1	9·9
11	2852	50	Ma	10+1	10·4
12	2853	117	Gi	9−1·5, 10+4	10·2
14	2855	55	Bo	7 (5) v (3) 8	9·6
16	2857	60	D	10+3	10·2*b*
23	2864	64	Ad	=10	10·5*b*
23	2864	120	Bn	10+1	10·4
24	2865	117	Gi	9−2·5, 10+1	10·4
25	2866	60	D	10+1	10·4*b*
28	2869	80	Ca	10+1	10·4
July					
2	2873	90	Bh	10−1	10·6
5	2876	120	Bn	13 (1) v (2) 16	10·8*b*
5	2876	117	Gi	10−1·5, 17+2·5	10·6
5	2876	60	D	10−4·5	11·0*b*
8	2879	,,	,,	13 (1) v (4) 24, 13−2	10·8*b*
8	2879	120	Bn	13 (2) v (1) 16, 17−1	11·0
9	2880	48	Wi	10−2, 17+2	10·7
10	2881	79	Ma	10−4, =17	10·9
15	2886	117	Gi	10−2·5, 17+2	10·7
18	2889	90	Bh	10−5, =17	10·9
25	2896	64	Ad	=20	11·4
25	2896	120	Bn	=18, 28+2	11·8
25	2896	48	Wi	=20	11·4*b*
30	2901	117	Gi	17−3·5, 18+2	11·4*b*
31	2902	48	Wi	=18	11·8
31	2902	64	Ad	=20	11·4*b*
Aug					
3	2905	,,	,,	20 (1) v (1) 18	11·6
6	2908	90	Bh	17−5, 18+5	11·3
7	2909	79	Ma	20−1, =18	11·7
8	2910	64	Ad	25 (1) v (3) 28	11·7
8	2910	120	Bn	18 (1) v (2) 28	11·8
9	2911	55	Bo	15 (1) v (2) 20	11·1
15	2917	117	Gi	17−2, 18+2·5	11·3
19	2921	90	Bh	17−6, 18+3	11·5
23	2925	55	Bo	20 (1) v (3) 18	11·5
25	2927	90	Bh	17−7, 18+2	11·6
25	2927	79	Ma	=18	11·8
29	2931	,,	,,	=18	11·8
29	2931	117	Gi	=18	11·8
30	2932	90	Bh	20−3, 25−1	11·7
30	2932	55	Bo	18 (1) v (1) 28	11·9
Sept					
3	2936	79	Ma	18−2	12·0
3	2936	120	Bn	18 (3) v (2) 28	11·9*b*
4	2937	55	Bo	18 (1) v (3) 28	11·8
5	2938	90	Bh	=25	11·7
5	2938	48	Wi	20−3	11·7*b*
7	2940	85	Bn	18 (1) v (2) 28	11·8
8	2941	64	Ad	=18	11·8
10	2943	85	Bn	18 (1) v (2) 28	11·8
10	2943	90	Bh	=20	11·4
12	2945	160	Bo	20 (1) v (1) 18	11·6*b*
12	2945	150	Ad	18 (1) v (2) 28	11·8*b*
14	2947	117	Gi	17−3·5, 18+2	11·4

Mar. 16, Orange.
April 3, D, Difficult.
May 16, Difficult.

July 5, Aug. 8, Bn, t.
Aug. 25, Ma, ±.
Sept. 3, Bn, t.

(6044) S HERCULIS—*continued.*

1921 Sept					
15	2948	150	Ad	18 (1) v (2) 28	11·8*b*
21	2954	120	Bn	17 (3) v (1) 18	11·6
21	2954	90	Bh	10−5	11·0
22	2955	82	Ad	10 (2) v (1) 17	10·7
22	2955	48	Wi	17−4, 18+5	11·3
23	2956	160	Bo	13 (1) v (1) 17	10·8*b*
24	2957	120	Bn	17 (2) v (1) 18	11·5
24	2957	90	Bh	10−3	10·8
25	2958	55	Bo	13 (2) v (3) 17	10·7
25	2958	64	Ad	10 (1) v (1) 17	10·7*b*
25	2958	79	Ma	9 (1) v (1) 17, 10−2	10·5
27	2960	120	Bn	17 (1) v (3) 18	11·1
28	2961	90	Bh	10−2	10·7
30	2963	55	Bo	9 (2) v (3) 10	10·2
30	2963	117	Gi	=10	10·5*b*
Oct					
1	2964	82	Ad	10 (1) v (3) 17	10·6
1	2964	90	Bh	10−2	10·7
2	2965	48	Wi	10−3, 16+3	10·8
4	2967	120	Bn	17−1	11·0
5	2968	90	Bh	10+1	10·4
6	2969	55	Bo	9 (3) v (2) 10	10·3
6	2969	48	Wi	10−1, 17+3	10·6
8	2971	90	Bh	10+1	10·4
9	2972	48	Wi	10−3	10·8*b*
9	2972	64	Ad	=10	10·5*b*
10	2973	75	Gi	m−7·5, 8+1·5	10·0
11	2974	48	Wi	10−2	10·7
15	2978	90	Bh	10+3	10·2
16	2979	50	Bn	m (3) v (1) 8	9·9
17	2980	90	Bh	=9, 10+5	10·0
23	2986	150	,,	10+3	10·2
23	2986	50	Bn	m (2) v (1) 10	10·1
30	2993	,,	,,	=m	9·4
30	2993	47	Gi	=m	9·4*b*
31	2994	55	Bo	m (1) v (1) 8	9·7
Nov					
6	3000	50	Bn	1 (3) v (1) m	9·3
6	3000	90	Bh	9+3	9·7
12	3006	50	Bn	6 (4) v (1) 1	9·1
18	3012	47	Gi	5−3·5, 6+1	8·7
23	3017	50	Bn	6+1	8·7
24	3018	90	Bh	6−2	9·0
26	3020	45	,,	6−1	8·9
27	3021	50	Bn	5 (2) v (1) 6	8·6
28	3022	47	Gi	5−1·5, 6+3·5	8·4*b*
Dec					
3	3027	90	Bh	=5	8·3
4	3028	45	,,	=4, 5+2	8·1
4	3028	50	Bn	5 (1) v (2) 6	8·5
13	3037	45	Bh	4+2, 5+5	7·9*b*
15	3039	,,	,,	4+3, 5+6	7·8
23	3047	30	Bn	3 (2) v (1) 4	7·9
25	3049	45	Bh	3−1, 4+4	7·7*b*
30	3054	,,	,,	1−6, 2−2, 3+4	7·1
30	3054	75	Gi	3−1, 4+1·5	7·8
1922 Jan					
3	3058	30	Bn	e (2) v (1) 3	7·5
10	3065	45	Bh	4+8, 5+10	7·3
13	3068	75	Gi	2 (3·5) v (1·5) 3	7·4*b*
20	3075	45	Bh	=2	6·9
Feb					
2	3088	90	,,	4+7, 5+10	7·4
5	3091	45	,,	=3	7·6
5	3091	55	Bo	5 (1) v (5) 7	8·4
1922 Feb					
16	3102	75	Gi	3 (2·5) v (1) 4	8·0
17	3103	90	Bh	4+2, 5+5	7·9
25	3111	55	Bo	4 (2) v (1) 5	8·2
25	3111	30	D	5−2, 6+3	8·5
26	3112	45	Bh	=5	8·3
Mar					
3	3117	75	Gi	5 (3) v (1·5) 6	8·6
15	3129	90	Bh	6+1	8·7
19	3133	,,	,,	6−1	8·9
22	3136	45	,,	6−4, 9+10	9·1
28	3142	90	,,	6−5, 10+12	9·3
Apr					
4	3149	45	,,	6−8, 10+8	9·7
14	3159	47	Gi	m (3·5) v (2·5) 8	9·8
17	3162	90	Bh	10+1	10·4
19	3164	75	Bn	8−3, 10+1	10·4
19	3164	80	Ca	10+1	10·4
20	3165	90	Wi	9−3, 10+2	10·3
23	3168	,,	Bh	=10	10·5
24	3169	33	Wi	=10	10·5*b*
29	3174	90	Bh	=10	10·5
May					
2	3177	,,	,,	10−2	10·7
2	3177	120	Bn	17 (1) v (1) 16	11·0
4	3179	140	Bo	10 (1) v (3) 17	10·6
4	3179	120	Wi	10−2, 17+2	10·7
6	3181	,,	,,	10−2	10·7
8	3183	,,	,,	10−5, 13−3	11·0
8	3183	117	Gi	10 (2) v (1) 13	10·6
8	3183	90	Bh	9−8, 10−3	10·8
12	3187	120	Wi	10−5, 18+5	11·2
13	3188	160	Bo	10 (2) v (1) 17	10·7
14	3189	120	Wi	10−5, 18+6	11·1
14	3189	,,	Bn	16 (2) v (1) 18	11·6
15	3190	80	Ca	17−1, 21+3	11·0*b*
17	3192	44	Wi	10−7, 18+2	11·4
19	3194	120	,,	20−4, 18+2	11·7
20	3195	140	Bo	15 (4) v (4) 18	11·4
21	3196	120	Wi	13−9, =18	11·7
21	3196	45	Bh	10−6, =15	11·1*b*
21	3196	120	Bn	16 (4) v (1) 18	11·7
22	3197	117	Gi	17 (3) v (1·5) 21	11·2
26	3201	90	Bh	17−4, 18+5	11·3
27	3202	82	Ad	=18	11·8
27	3202	55	Bo	20 (1) v (3) 18	11·5
June					
1	3207	120	Bn	18 (1) v (1) 28	11·9
4	3210	90	Bh	10−10	11·5
5	3211	117	Gi	=18	11·8
10	3216	90	Bh	=18	11·8
11	3217	82	Ad	=25	11·7*b*
12	3218	150	Bh	10−13, =18	11·8
15	3221	,,	,,	18−3, C+5	12·1
16	3222	140	Bo	20 (2) v (2) 18	11·6
23	3229	117	Gi	=18	11·8
26	3232	150	Bh	10−15, C+5	12·1
28	3234	79	Ma	=18	11·8
July					
1	3237	160	Bo	20 (3) v (1) 18	11·7
2	3238	90	Bh	18−2	12·0
10	3246	,,	,,	10−12, =18	11·8
11	3247	117	Gi	=18	11·8*b*
14	3250	90	Bh	17−7, 18+2	11·6
17	3253	140	Bo	20 (2) v (2) 18	11·6
19	3255	120	Bn	18 (2) v (1) 28	11·9

Jan. 13, 4^c.

Feb. 16, $4^c{\cdot}5$.

(6044) S HERCULIS—*continued.*

1922 July					
20	3256	82	Ad	17 (4) v (1) 18, 20 (1) v (1) 18	11·6
20	3256	79	Ma	18−2	12·0
20	3256	90	Bh	17−6, 15−5, 18+3	11·5
25	3261	117	Gi	10 (4·5) v (1·5) 18, 17−3·5	11·4
27	3263	90	Bh	10−6, 17−3, 18+6	11·2
29	3265	55	Bo	15 (3) v (2) 20	11·3
30	3266	120	Bn	=18	11·8
31	3267	82	Ad	20 (3) v (1) 18	11·7*b*
31	3267	79	Ma	18+1	11·7
Aug					
5	3272	90	Bh	10−4, 15+1	10·9
9	3276	117	Gi	10 (3·5) v (2) 17, 18+6	10·9
11	3278	90	Bh	10−2	10·7
15	3282	64	Ad	=10	10·5
15	3282	75	D	8−1, 10+2	10·2*b*
15	3282	,,	Bn	10+1	10·4
17	3284	79	Ma	9 (2) v (1) 17, 10−3	10·7
17	3284	45	Bh	=10	10·5
19	3286	55	Bo	8 (1) v (4) 10	10·2
20	3287	45	Bh	10+1	10·4
20	3287	117	Gi	=8, 10+1·5	10·2
20	3287	82	Ad	9 (2) v (1) 10	10·4*b*
23	3290	64	,,	9 (1) v (2) 10	10·2
23	3290	75	Bn	8 (1) v (1) 10	10·3
23	3290	79	Ma	9+1	9·9
25	3292	90	Bh	10+3	10·2
27	3294	55	Bo	8+3	9·8
29	3296	90	Bh	10+5	10·0
31	3298	,,	,,	6−10, 10+6	9·9
Sept					
4	3302	,,	,,	6−8, 10+8	9·7
5	3303	64	Ad	6 (2) v (1) 9	9·6*b*
7	3305	90	Bh	6−10, 10+6	9·9
9	3307	75	Bn	1 (2) v (1) m	9·3
10	3308	90	Bh	6−6, 10+10	9·5
11	3309	64	Ad	6 (1) v (2) 9	9·2
15	3313	90	Bh	6−2	9·0
15	3313	30	Bn	6 (1) v (1) 1	9·0
17	3315	75	Gi	6 (1·5) v (3) 1	8·9
18	3316	64	Ad	=6	8·8
20	3318	50	Bn	6 (1) v (1) 1	9·0
21	3319	90	Bh	6+2	8·6
23	3321	45	,,	=6	8·8
24	3322	50	Bn	6 (1) v (2) 1	8·9
24	3322	25	Ad	5 (1) v (1) 6	8·5*b*
Oct					
4	3332	90	Bh	4−1, 5+1	8·2
6	3334	45	,,	3−4, 4+1	8·0
6	3334	50	Bn	3 (2) v (1) 4	7·9
12	3340	45	Bh	3−3, 4+2	7·9
13	3341	50	Bn	e (3) v (1) 3	7·5
13	3341	25	Ad	=5	8·3
14	3342	55	Bo	3 (3) v (2) 4	7·9
14	3342	33	Wi	=5	8·3
14	3342	117	Gi	4+2	7·9*b*
15	3343	50	Bn	e (1) v (1) 3	7·4
18	3346	,,	,,	e (2) v (1) 3	7·5
20	3348	45	Bh	2−4, 3+3	7·3
22	3350	25	Ad	4 (1) v (3) 5	8·1
22	3350	50	Bn	e (3) v (1) 3	7·5
25	3353	45	Bh	2−3, 3+4	7·2
28	3356	50	Bn	3 (1) v (3) 4	7·7
1922 Nov					
1	3360	45	Bh	1−3, 2+2	6·7
4	3363	25	Ad	3 (1) v (1) 4	7·8*b*
4	3363	50	Bn	3 (1) v (3) 4	7·7
8	3367	75	Gi	3 (4) v (2·5) 4	7·9
9	3368	45	Bh	=2	6·9
13	3372	50	Bn	e (2) v (1) 3	7·5
15	3374	,,	,,	e (3) v (1) 3	7·5
18	3377	45	Bh	2−2, 3+5	7·1
21	3380	,,	,,	2−5, 3+1	7·5
24	3383	,,	,,	=3, 4+5	7·6
24	3383	50	Bn	3 (2) v (1) 4	7·9
25	3384	47	Gi	3 (3·5) v (1) 4	8·0*b*
29	3388	50	Bn	3 (2) v (1) 4	7·9
Dec					
6	3395	45	Bh	=3	7·6
7	3396	47	Gi	4 (3·5) v (2) 5	8·2*c*
11	3400	45	Bh	4−1	8·2
16	3405	90	,,	=4, =5	8·2*b*
20	3409	30	Bn	5 (2) v (1) 6	8·6
23	3412	45	Bh	=4, 5+2	8·1
25	3414	90	Bh	=5	8·3
1923 Jan					
4	3424	,,	,,	4−2, =5	8·3
5	3425	40	Ry	5−3, =6	8·7*b*
11	3431	90	Bh	4−4, 6+3	8·5
20	3440	30	Bn	=m	9·4
Feb					
4	3455	90	Bh	6−9, 10+9	9·7
8	3459	,,	,,	10+4	10·1
23	3474	,,	,,	10−1	10·6
Mar					
13	3492	,,	,,	10−5	11·0
17	3496	,,	,,	10−8	11·3
21	3500	,,	,,	10−10	11·5
24	3503	117	Gi	=21	11·3
25	3504	90	Bh	17−6, 18+3	11·5*b*
27	3506	,,	,,	17−8, 18+1	11·7
Apr					
1	3511	,,	,,	18−1	11·9
8	3518	,,	Wh	<20	<11·4
9	3519	,,	Bh	18−1	11·9
13	3523	,,	,,	17−8, 18+1	11·7
13	3523	85	Bn	18 (1) v (1) 28	11·9
14	3524	44	Wi	18−2	12·0*b*
22	3532	45	Bh	=18	11·8*b*
24	3534	275	Bo	18 (1) v (1) 28	11·9*c*
May					
3	3543	140	,,	18 (1) v (1) 28	11·9
3	3543	90	Bh	=18	11·8
3	3543	,,	Wh	20−3	11·7
5	3545	120	Bn	=28	11·9
7	3547	90	Bh	18+1	11·7
7	3547	117	Gi	=18	11·8
14	3554	60	D	18−2	12·0*b*
16	3556	120	Bn	18 (2) v (1) 28	11·9
17	3557	55	Bo	20 (3) v (1) 18	11·7
17	3557	90	Bh	20−1	11·5*b*
21	3561	,,	,,	20+1, 18+3	11·4
21	3561	120	Bn	18 (3) v (2) 28	11·9
30	3570	90	Bh	17−3, 18+6	11·2
June					
2	3573	,,	,,	17−1	11·0
2	3573	,,	Wh	=20	11·4

July 25, 6c.
Aug. 15, D, 3-in.

April 8, Invisible.
May 14, Difficult.

(6044) S HERCULIS—*continued.*

1923					
June					
6	3577	60	D	16−1	11·2
8	3579	117	Gi	10−2, =13	10·7
10	3581	60	D	10−4, 16+2	10·9
11	3582	90	Bh	10−2, 17+2	10·7
18	3589	60	D	10−1	10·6
23	3594	90	Wh	10 (1) v (2) 13	10·6
23	3594	,,	Bh	10+5	10·0
July					
4	3605	60	D	6−2, 1+1	9·0
4	3605	75	Gi	5 (7·5) v (2) 1, 6+2·5	9·0
5	3606	90	Bh	9+3, 10+8	9·7
6	3607	30	Bn	6 (2) v (1) 1	9·0
7	3608	90	Wh	5 (1) v (3) 10	8·9
7	3608	60	Ga	=6, 9+10	8·9
8	3609	45	Bh	6−5, 9+7, 10+12	9·3
8	3609	60	D	6−1, 1+2	8·9
13	3614	30	,,	5−3, 6+2	8·6
16	3617	,,	,,	5−2, 6+3	8·5
18	3619	60	Ga	5−5, =6, =7	8·8
20	3621	30	D	5−2, 6+3	8·5
20	3621	45	Bh	5+1, 6+3	8·3
21	3622	50	Bn	4 (2) v (1) 5	8·2
21	3622	34	Li	3 (8) v (2) 4	8·0
26	3627	45	Bh	4+1, 5+3	8·0
31	3632	90	,,	=3	7·6
Aug					
3	3635	,,	,,	=3, 4+3	7·7
3	3635	,,	Wh	=5	8·3
4	3636	50	Bn	3 (3) v (1) 4	8·0
4	3636	51	Ma	=5	8·3
8	3640	90	Bh	3+1	7·5
8	3640	50	Bn	3 (2) v (1) 4	7·9
10	3642	120	Ga	=5, 6+3, 7+5	8·4
11	3643	30	D	3−4, 4+2	7·9
11	3643	90	Bh	=3, 4+3	7·7
13	3645	50	Bn	3 (3) v (1) 4	8·0
15	3647	45	Bh	3+2, 4+7	7·4
18	3650	90	,,	2−5, =3, 4+3	7·6
22	3654	,,	,,	3+5	7·1
22	3654	30	D	=e	7·2
22	3654	,,	Bn	e (2) v (1) 3	7·5
26	3658	45	Bh	=2, 3+4	7·1
28	3660	25	Bn	e (2) v (1) 3	7·5
30	3662	50	,,	=3	7·6
30	3662	45	Bh	=2, 3+4	7·1
Sept					
1	3664	30	D	3−4, 4+2	7·9
2	3665	90	Bh	=3	7·6
4	3667	51	Ma	4+2	7·9
4	3667	90	Wh	1 (1) v (1) 5	7·4
5	3668	50	Bn	3 (1) v (2) 4	7·8
7	3670	45	Bh	2−5, =3	7·5
8	3671	30	D	3−1, 4+4	7·7
9	3672	55	Bo	2 (1) v (5) 3	7·0
11	3674	50	Bn	3 (1) v (1) 4	7·8
11	3674	45	Bh	2−6, =3	7·6
12	3675	30	D	=e	7·2*b*
13	3676	45	Bh	=3, 4+3	7·7
16	3679	,,	,,	=3	7·6
16	3679	50	Bn	3 (2) v (1) 4	7·9
16	3679	,,	Ma	1 (1) v (1) 6, 1−5, 5+3	7·5
21	3684	50	Bn	3 (1) v (1) 4	7·8
22	3685	90	Bh	3−1, 4+4	7·7
26	3689	,,	,,	=3	7·6
28	3691	,,	Wh	1 (2) v (1) 5	7·7
30	3693	55	Bo	2 (4) v (3) 3	7·3*b*
30	3693	30	D	3−2, 4+3	7·8
30	3693	60	Ga	4+3, 5+5	7·8
Oct					
1	3694	90	Bh	=3, 4+3	7·7
4	3697	50	Bn	3 (1) v (1) 4	7·8
4	3697	,,	Ma	=4, 5+3, 6+4	8·2
5	3698	45	Bh	3−2, 4+1	7·9
9	3702	90	,,	=3	7·6
11	3704	60	Ga	3−5, =4, 5+5	8·0
12	3705	90	Bh	=3	7·6
14	3707	50	Bn	3 (2) v (1) 4	7·9
17	3710	30	Ry	4−1, 5+2, 6+7	8·1
19	3712	90	Bh	3−2, 4+1	7·9
22	3715	50	Bn	3 (2) v (1) 4	7·9
23	3716	45	Bh	3−4, =4	8·0
Nov					
1	3725	,,	,,	=4, 5+2	8·1
3	3727	50	Bn	3 (3) v (1) 4	8·0
3	3727	30	Ry	4−3·5, =5, 6+7·5	8·3
4	3728	,,	D	3−4, 4+1	8·0
7	3731	45	Bh	4−2, 5+2	8·2*b*
9	3733	90	,,	4−3, 5+1	8·3*b*
10	3734	50	Bn	5 (1) v (2) 6	8·5
11	3735	45	Bh	4−3, =5, 6+5	8·3
14	3738	50	Bn	5 (2) v (1) 6	8·6
15	3739	,,	Ry	5−3·5, 6+2·5	8·6
16	3740	45	Bh	4−3, 6+4	8·4
19	3743	50	Bn	5 (2) v (3) 6	8·5
30	3754	,,	,,	1 (1) v (2) m	9·2
30	3754	45	Bh	5−4, 6+1	8·7*b*
Dec					
3	3757	50	Bn	m+1	9·3
4	3758	90	Bh	5−5, 6−1	8·8*b*
8	3762	,,	,,	=6, =7	8·8*b*
12	3766	,,	,,	6−2	9·0*b*
25	3779	45	,,	6 (2) v (3) 8	9·3*b*
1924					
Jan					
3	3788	,,	,,	10−2	10·7
5	3790	90	,,	10 (1) v (3) 18	10·8
5	3790	50	Ry	16−2·5, 17−1, 21+4	11·1
6	3791	120	Bn	10 (5) v (1) 16	11·0
11	3796	90	Bh	10−7	11·2
11	3796	80	Ry	13−4, 20+1	11·2
14	3799	120	Bn	16−2·5	11·4*b*
16	3801	90	Bh	10−8	11·3
23	3808	,,	,,	10 (3) v (1) 18, 17 (2) v (1) 18	11·5
25	3810	,,	,,	17 (3) v (1) 18	11·6
27	3812	,,	,,	10−10, 18+2	11·6
27	3812	80	Ry	20−4	11·8*b*

July 7, 18, Ga, t.
July 21, Li, Distinctly buff colour.
Aug. 4, Ma, Pale red.
Aug. 22, D, 3-in. O.G.
Sept. 1, 7^{c}.
Sept. 12, About.
Sept. 16, Ma, Red.
Sept. 30, Oct. 11, Ga, T.
Oct. 4, Ma, Pale red.
Oct. 17, Nov. 3, Ry, t.
Nov. 15, Jan. 5, Ry, T.
Jan. 27, Ry, Very difficult.

(6044) S HERCULIS—*continued.*

1924						1924					
Feb						May					
1	3817	120	Bn	28 (1) v (1) 33	12·1	30	3936	30	D	6−4, 1+2	9·1
7	3823	80	Ry	=28	11·9*b*	31	3937	90	Bh	=6	8·8
11	3827	90	Bh	18−2	12·0*b*	June					
14	3830	150	Bn	31 (1) v (4) C	12·2	3	3940	80	Ry	6−1	8·9
21	3837	90	Bh	18−4, C+4	12·2	5	3942	30	D	=1	9·2
26	3842	,,	,,	18−5	12·3*b*	9	3946	60	,,	6−4, 1+1	9·1
28	3844	,,	,,	18−5, C+3	12·3	10	3947	30	Ry	5−6, 6−0·5	8·9
29	3845	80	Ry	28−3, 31−1	12·2	11	3948	90	Bh	=6	8·8
Mar						13	3950	,,	,,	5−4, 6−1	8·8
2	3847	90	Bh	18 (1) v (1) C	12·2	18	3955	,,	,,	6+1	8·7
4	3849	120	Bn	31 (1) v (1) C, 33−2	12·4	20	3957	30	Ry	5−4, 6+3	8·6
4	3849	60	D	<25	<11·7	20	3957	50	Bn	6 (1) v (2) 1	8·9
4	3849	170	Ry	31−3, =33	12·3*b*	21	3958	90	Wh	=6	8·8
4	3849	150	Bh	C+2	12·4	22	3959	30	D	5−4, 6+1	8·7
7	3852	90	,,	18 (1) v (1) C	12·2	24	3961	90	Bh	5−5, 6−1	8·8
9	3854	,,	,,	18 (1) v (2) C	12·1	26	3963	30	D	6−1, 1+3	8·9
9	3854	150	Bn	31 (1) v (1) C, 31−3	12·4	26	3963	,,	Ry	5−1·5, 6+3	8·5
13	3858	,,	,,	31−3, 33−3, C+3	12·4	27	3964	90	Bh	5−3, 6+1	8·6
14	3859	170	Ry	31−1	12·2*b*	30	3967	,,	,,	=4, =5	8·2*b*
19	3864	90	Bh	18 (1) v (2) C	12·1	30	3967	30	D	5−4, 6+2	8·6*b*
26	3871	,,	,,	18 (1) v (3) C	12·0	July					
27	3872	170	Ry	28−2, 31+2	12·0*b*	3	3970	,,	Ry	=5, 6+4	8·3
29	3874	90	Bh	18−2	12·0	4	3971	90	Bh	=4, =5	8·2*b*
Apr						6	3973	30	D	5−2, 6+2	8·5
1	3877	120	Bn	31−1, =33	12·2	8	3975	,,	Ry	=5, 6+3	8·4
2	3878	90	Bh	18 (1) v (1) C	12·2	9	3976	,,	D	5−1, 6+4	8·4
3	3879	80	Ry	28−1·5	12·1*b*	9	3976	45	Bh	=4, 5+4	8·0
4	3880	90	Bh	18 (1) v (2) C	12·1	11	3978	90	,,	=4	8·1
4	3880	60	D	<18	<11·8	11	3978	50	Bn	4 (1) v (2) 7	8·3
4	3880	120	Bn	28 (2) v (1) 31	12·1	14	3981	90	Bh	4+1	8·0
7	3883	,,	,,	28 (2) v (1) 31	12·1	18	3985	20	Ry	5−1, 6+4	8·4
8	3884	,,	Wi	18−5	12·3*b*	19	3986	90	Bh	3 (1) v (1) 4	7·8
8	3884	90	Bh	=18	11·8	19	3986	,,	Wh	=5	8·3
9	3885	120	Bn	28 (3) v (2) 33	12·1	19	3986	50	Bn	4 (2) v (1) 5	8·2
11	3887	90	Bh	10−10, 18+3	11·5*b*	23	3990	30	Ry	5−1·5, 6+4	8·4
14	3890	,,	,,	10−8, 17−4	11·3	24	3991	45	Bh	3 (1) v (1) 4	7·8
20	3896	,,	,,	17−2	11·1	24	3991	50	Bn	=4	8·1
22	3898	80	Ry	20−2	11·6*b*	28	3995	,,	Ry	5−1, 6+6	8·3
25	3901	,,	,,	13−1, 22+2	11·0	29	3996	45	Bh	3 (1) v (1) 4	7·8
25	3901	90	Bh	10−3	10·8	29	3996	50	Bn	3 (2) v (1) 4	7·9
27	3903	120	Wi	10−2, 17+2	10·7	Aug					
30	3906	90	Bh	10−1	10·6	2	4000	,,	,,	3 (3) v (1) 4	8·0
May						2	4000	45	Bh	=3	7·6
2	3908	80	Ry	10−2, 13+1	10·6	2	4000	30	Ry	5−0·5, 6+5	8·3
3	3909	90	Bh	=10	10·5	7	4005	90	Bh	=3	7·6
4	3910	60	D	8−4, 10+1	10·4	7	4005	50	Bn	3 (3) v (1) 4	8·0
5	3911	90	Bh	10+2	10·3	7	4005	,,	Ma	=5	8·3*b*
5	3911	120	Bn	10 (1) v (2) 17	10·6	9	4007	30	D	=5	8·3
7	3913	60	D	8−2·5, 10+1·5	10·3	12	4010	50	Bn	3 (3) v (1) 4	8·0
8	3914	50	Ry	9−1, 10+2·5	10·2	13	4011	30	Ry	5−1, 6+5·5	8·3
10	3916	90	Bh	10+4	10·1	15	4013	90	Bh	=4	8·1
13	3919	60	D	m−5, 8+3	9·8	17	4015	60	D	4−1, 5+2	8·2*b*
13	3919	90	Bh	6 (2) v (3) 10	9·5	18	4016	50	Ma	4−1, 5+2	8·2
16	3922	,,	,,	6 (1) v (3) 10	9·2	19	4017	,,	Bn	4+1	8·0
16	3922	50	Bn	1 (3) v (1) m	9·3	19	4017	80	Wi	5−2, 6+3	8·5
20	3926	,,	Ry	6−3, 8+5	9·3	19	4017	90	Bh	3+1	7·5
21	3927	30	D	1−2, m+1	9·3*b*	22	4020	,,	,,	=3	7·6
22	3928	45	Bh	5−5, 6−2	8·9	22	4020	,,	Wh	=6	8·8
26	3932	90	,,	=6	8·8	24	4022	50	Bn	3 (4) v (1) 4	8·0
26	3932	30	D	6−2, 1+1	9·0	25	4023	35	Ry	5−2·5, 6+4	8·5
27	3933	50	Bn	1 (3) v (1) m	9·3	27	4025	90	Bh	3 (1) v (1) 4	7·8
27	3933	90	Bh	6+1	8·7	29	4027	35	Ry	5−4, 6+3	8·6
27	3933	30	Ry	6−1	8·9	31	4029	75	Bn	5 (3) v (1) 6	8·7

May 8, t.
May 20, T.
May 26, D, 7^{c}.
May 27, Ry, t.

June 10, 20, 26, July 3, 8, 23, 28, Aug. 2, 13, Ry, t.
Aug. 7, Ma, About. Reddish.

(6044) S HERCULIS—*continued.*

1924					
Sept					
2	4031	90	Bh	=4	8·1
8	4037	,,	,,	4 (1) v (1) 6	8·4
8	4037	50	Bn	6+1	8·7
10	4039	40	D	5−3, 6+3	8·5
12	4041	90	Bh	6+1	8·7*b*
14	4043	50	Bn	=1	9·2
15	4044	35	Ry	5−7, 6+1	8·8*b*
16	4045	45	Bh	=5, =6	8·5*b*
22	4051	50	Bn	1 (4) v (1) m	9·3
23	4052	90	Bh	6−1	8·9
24	4053	35	Ry	6−4, 8+5	9·4
26	4055	90	Bh	6 (2) v (3) 10	9·5
27	4056	50	Bn	1 (4) v (1) m	9·3
30	4059	35	Ry	6−4, 8+1·5	9·5*b*
Oct					
1	4060	90	Bh	6 (1) v (2) 10	9·4
8	4067	,,	,,	6 (1) v (1) 10	9·7
11	4070	,,	,,	6 (2) v (1) 10	9·9
13	4072	50	Bn	m−2, 9+4	9·6
15	4074	90	Bh	6 (2) v (1) 10	9·9
16	4075	30	Ry	m−3, 8+1	9·8
17	4076	90	Wh	=8	10·1
22	4081	50	Bn	9 (2) v (1) 10	10·4
23	4082	34	Li	m (4) v (6) 8	9·7

Oct. 16, T.

1924					
Oct					
23	4082	40	D	10+4	10·1
24	4083	90	Bh	6 (4) v (1) 10	10·2
27	4086	,,	,,	10+3	10·2
29	4088	80	Ry	10+2	10·3*b*
31	4090	90	Wh	8 (1) v (1) 16	10·6
31	4090	,,	Bh	6 (4) v (1) 10	10·2
Nov					
1	4091	200	Ry	10−0·5	10·6
3	4093	120	Bn	10 (1) v (1) 16	10·8*b*
3	4093	90	Bh	10−2	10·7
15	4105	,,	,,	10−5	11·0
16	4106	120	Bn	16 (2) v (3) 18	11·4
20	4110	200	Ry	20−1	11·5
27	4117	120	Bn	18+1	11·7
Dec					
1	4121	90	Bh	<17	<10·9
9	4129	120	Bn	<10	<10·5
13	4133	90	Bh	18−1	11·9
24	4144	,,	,,	C+5	12·1
24	4144	120	Bn	28−2, 31−1	12·2
28	4148	,,	,,	31−1, =33	12·2
28	4148	90	Bh	18 (1) v (2) C	12·1
31	4151	,,	,,	18 (1) v (1) C	12·2

Dec. 1, 9, Not seen.

(6512) T HERCULIS. (V. 3.)

H.D. 180531.

The combined light of Hagen's 45 and 54 is taken as $12^{m}\cdot04$.

Date.	Julian Date.	Inst.	Observer.	Comparisons.	Deduced Mag.
1920					
Jan					
8	2332	75	Bn	13 (3) v (1) 15	9·5
15	2339	45	Br	8−2·5, 14+5	8·9
15	2339	23	Bo	8 (1) v (3) 10	8·8
19	2343	,,	,,	=8	8·7*b*
19	2343	75	Bn	8 (2) v (1) 11	8·8
23	2347	23	Bo	7 (1) v (3) 8	8·2
26	2350	50	Bn	6+1	7·7
27	2351	32	Ca	5−1, 9+2	8·2
31	2355	50	Bn	4 (2) v (1) 6	7·6
31	2355	23	Bo	4 (1) v (1) 6	7·5
Feb					
5	2360	,,	,,	4 (1) v (2) 6	7·4
11	2366	,,	,,	4 (1) v (3) 6	7·3
16	2371	,,	,,	4 (1) v (3) 6	7·3
16	2371	30	D	4−5, 6+1	7·7
18	2373	55	Bg	6−1, 7+1·5	7·9
18	2373	32	Ca	4−2, d+1	7·4*c*
18	2373	23	Bo	4 (1) v (1) 6	7·5
22	2377	,,	,,	4 (4) v (1) 6	7·7
27	2382	30	D	6−3, 5+1	8·1*b*
27	2382	23	Bo	4 (4) v (1) 6	7·7
28	2383	32	Ca	d−1, 6+2	7·6*b*

Date.	Julian Date.	Inst.	Observer.	Comparisons.	Deduced Mag.
1920					
Mar					
4	2388	23	Bo	7 (1) v (3) 8	8·2
6	2390	50	Bn	5 (4) v (1) 8	8·6
11	2395	45	Br	=8	8·7*b*
12	2396	55	Bg	7−5, 8+1	8·6
12	2396	23	Bo	8 (1) v (1) 11	8·8
14	2398	32	Ca	8−2, =10, 1+2·5	8·9*b*
18	2402	45	Br	8−5, 14+2	9·2
18	2402	30	D	=1	9·2
19	2403	23	Bo	13 (3) v (1) 14	9·4
19	2403	50	Bn	8 (2) v (1) 11	8·8
23	2407	30	,,	11 (1) v (3) 13	8·9
23	2407	,,	D	=1, 14+2	9·2
25	2409	50	Bn	13 (2) v (1) 15	9·4
30	2414	23	Bo	=14	9·4
30	2414	30	D	14−1, 22+3	9·5*b*
Apr					
6	2421	55	Bo	14 (1) v (3) 16	9·5
11	2426	30	D	14−3, 22+1	9·7*b*
13	2428	60	,,	22 (1) v (3) 29, 22−3	10·1*b*

Mar. 11, About.

(6512) T HERCULIS—*continued.*

1920 Apr					
16	2431	60	D	22 (4) v (1) 29, 29+3	10·7
19	2434	160	Br	22−4, 29+8	10·2
21	2436	60	D	22 (3) v (1) 29, 29+3	10·7*b*
21	2436	75	Bn	22 (3) v (1) 26	10·3
29	2444	,,	,,	22 (5) v (1) 26	10·3*b*
May					
2	2447	,,	Bg	26−5, 29+1	10·9*b*
7	2452	160	Br	29−1, 31+1	11·1
7	2452	120	Bn	29−1	11·1*b*
9	2454	150	,,	29 (1) v (2) 31	11·0
10	2455	75	Bg	=29	11·0
12	2457	60	D	=29, 31+3	10·9
13	2458	120	Bn	29 (1) v (1) 31	11·1
14	2459	79	Ma	=29	11·0
15	2460	80	Ca	29−2	11·2
19	2464	75	Bg	31−1, 34+3	11·3
19	2464	79	Ma	29−1·5	11·1
19	2464	120	Bn	29 (1) v (1) 31	11·1
21	2466	200	,,	29 (2) v (1) 31	11·1
21	2466	160	Br	=31	11·2
21	2466	60	D	29−1	11·1*b*
22	2467	79	Ma	=29	11·0
23	2468	200	Bn	29 (1) v (2) 31	11·0
24	2469	60	Ad	=31	11·2
25	2470	,,	D	=31	11·2*b*
29	2474	120	Bn	26 (4) v (1) 29	10·9
June					
1	2477	150	Ad	=31	11·2*b*
1	2477	75	Bg	=31	11·2*b*
5	2481	120	Bn	26 (2) v (1) 29	10·8
5	2481	160	Br	29+3	10·7
6	2482	64	Ad	=29	11·0
8	2484	32	Ca	26−4, 29+2	10·8
8	2484	60	D	22 (2) v (3) 29, 22−5	10·3
8	2484	120	Bn	22 (5) v (1) 25	10·4
11	2487	60	D	14−3, 22+1	9·7
14	2490	79	Ma	22+2	9·6
15	2491	30	D	14−2	9·6*b*
16	2492	32	Ca	14−2, 22+2	9·6
18	2494	50	Bn	13 (3) v (1) 15	9·5
19	2495	64	Ad	14 (1) v (1) 22	9·6*b*
19	2495	45	Br	8−5, 14+2	9·2
19	2495	30	D	14−1	9·5*b*
22	2498	50	Ma	8 (1) v (1) 19	9·3
22	2498	30	D	10−1, 1+1	9·0
23	2499	55	Bg	14−1, 22+3	9·5
23	2499	25	Ad	8 (1) v (3) 14	8·9*b*
29	2505	32	Ca	9−1, 8+2	8·5*c*
30	2506	30	D	5−4, 8+3	8·5*b*
July					
3	2509	55	Bg	7−4, 8+2	8·5*b*
7	2513	32	Ca	6−3, =5, 9+3	8·1
8	2514	30	Bg	6−2, 7+1	8·0
8	2514	,,	D	6−2, 5+2	8·0
12	2518	,,	,,	=6, 5+3	7·8*b*
13	2519	55	Bg	=6, 7+3	7·8
14	2520	50	Bn	4 (3) v (2) 6	7·6
14	2520	30	D	4−5, 6+2	7·6
16	2522	,,	,,	4−4, 6+3	7·5
17	2523	45	Br	4−1, 6+4	7·3
18	2524	30	D	4−4, 6+3	7·5
19	2525	50	Bn	4 (1) v (3) 6	7·3
20	2526	32	Ca	d−1, 6+2	7·6*c*
20	2526	30	D	4−2, 6+4	7·4
21	2527	,,	,,	4−4, 6+3	7·5*b*
24	2530	25	Ad	4 (4) v (1) 6	7·7
27	2533	30	D	4−4, 6+4	7·5*b*
28	2534	55	Bg	4−5, 6+1	7·7*b*
1920 July					
30	2536	45	Br	4+1	7·1
31	2537	55	Bg	4−5, 6+1·5	7·7
Aug					
1	2538	30	Bn	4 (2) v (3) 6	7·4
1	2538	,,	D	4−6, 6+1	7·7*b*
3	2540	,,	,,	=6	7·8
3	2540	50	Ma	4−1, 6+2	7·4
5	2542	,,	,,	6+1	7·7
5	2542	48	Bg	7−1·5, 8+4·5	8·2
6	2543	30	Bn	4 (3) v (1) 6	7·7
6	2543	45	Br	4−2, 6+4	7·4
7	2544	30	D	6−1, 5+2	7·9
7	2544	32	Ca	d−1, 6+2	7·6
9	2546	30	Bn	6+1	7·7
10	2547	,,	D	6−1, 5+2	7·9
10	2547	50	Ma	6+0·5	7·8
14	2551	30	Bn	5 (1) v (2) 8	8·3
15	2552	25	Ad	6 (2) v (1) 9	8·2
15	2552	55	Bg	7−3, 8+3	8·4
16	2553	23	Bo	4 (3) v (1) 6	7·7
16	2553	30	D	5−1, 8+3	8·3
19	2556	,,	Bn	5 (2) v (3) 8	8·3
20	2557	32	Ca	5−1, 9+2	8·2
22	2559	50	Ma	4 (3) v (2) 14	8·5
22	2559	30	Bn	7 (3) v (1) 9, 5 (4) v (1) 8	8·4
22	2559	25	Ad	9 (1) v (1) 8	8·5
22	2559	55	Bg	=8	8·7
25	2562	30	D	10−1, 1+3	8·9*b*
26	2563	55	Bg	8−1, 10+1	8·8
26	2563	30	Bn	8+1·5	8·5
29	2566	25	Ad	=11	8·9
Sept					
4	2572	50	Ma	14 (1) v (1) 22	9·6
5	2573	32	Ca	14−2, 22+2	9·6
5	2573	75	Bn	13 (3) v (1) 15	9·5
6	2574	64	Ad	14 (2) v (1) 22	9·7*b*
8	2576	23	Bo	14 (1) v (2) 22	9·6
8	2576	60	D	14−3, 22+2	9·7
10	2578	160	Br	14−2, 22+2	9·6
10	2578	64	Ad	26 (1) v (2) 29	10·6
10	2578	75	Bn	22 (2) v (1) 26	10·2
10	2578	79	Ma	14 (1) v (1) 22	9·6
12	2580	60	D	=26, 29+4	10·5
12	2580	75	Bn	26+1	10·3
12	2580	55	Bo	14 (3) v (1) 22	9·7
16	2584	64	Ad	=29	11·0
16	2584	120	Bn	26 (4) v (1) 29	10·9
18	2586	95	,,	=29	11·0
18	2586	55	Bg	29−1·5, 34+5	11·1
18	2586	79	Ma	29+0·5	10·9
19	2587	55	Bo	=29	11·0
20	2594	160	Br	31−2, 34+2	11·4
20	2597	,,	Bo	32 (3) v (1) 33	11·5
29	2597	183	Ma	31−1·5	11·3*b*
Oct					
1	2599	160	Br	34−2·5, 45+5	11·9
2	2600	120	Bn	34 (2) v (1) 42	12·0
4	2602	55	Bo	39 (1) v (1) 43	12·2
6	2604	120	Bn	45 (1) v (2) 48	12·5
7	2605	160	Br	34−5, 45+2·5	12·2
9	2607	150	Ad	=39	12·0*b*
9	2607	55	Bo	40 (1) v (1) 42	12·2
9	2607	79	Ma	34−1·5	11·8*b*

Aug. 5, Ma, Pale yellow.
Sept. 29, Ma. Difficult.

(6512) T HERCULIS—*continued.*

1920 Oct					
9	2607	120	Bn	45 (1) v (1) 48	12·6
11	2609	,,	,,	45 (3) v (1) 48	12·6
11	2609	130	Bo	42 (3) v (1) 45	12·4
16	2614	160	,,	45 (1) v (2) 50	12·5
18	2616	120	Bn	48−1	12·8
19	2617	75	Bg	42−2, 48+3	12·4
20	2618	120	Bn	45−3, 48+1	12·7*b*
20	2618	90	Bo	45 (1) v (1) 50	12·6
24	2622	150	Ad	=39	12·0*b*
25	2623	120	Bn	=48	12·7*b*
29	2627	,,	Br	45−3	12·7
29	2627	,,	Bn	45−4, 48+1	12·7
30	2628	55	Bo	50 (1) v (3) 52	12·9
30	2628	75	Bg	42−2, =45, 48+3	12·4
Nov					
1	2630	150	Bn	45 (2) v (1) 48	12·6
4	2633	,,	,,	45−4, 48+1·5	12·7
6	2635	130	Bo	=45	12·4
16	2645	120	Bn	34 (3) v (1) 42	12·1
16	2645	55	Bg	=34	11·7*b*
17	2646	79	Ma	29−5, 31−1	11·4
17	2646	130	Bo	31 (1) v (3) 34	11·3
18	2647	120	Br	=34	11·7
21	2650	,,	Bn	31+0·5	11·1
21	2650	64	Ad	=31	11·2
Dec					
1	2660	55	Bo	14 (1) v (3) 22	9·5
1	2660	45	Br	14−2, 22+2	9·6
3	2662	32	Ca	14−2, 22+2	9·6
3	2662	79	Ma	14 (3) v (1) 22, 22+2	9·7
3	2662	50	Bn	22 (1) v (2) 26	10·0
9	2668	,,	,,	8 (3) v (1) 11	8·8
16	2675	,,	Ma	6 (3) v (1) 14, 6−5	8·8
21	2680	75	Bn	5 (5) v (2) 8	8·5
27	2686	45	Br	6−2, 8+2	8·3
28	2687	48	Bg	7−2, 8+4	8·3
28	2687	30	Bn	7 (1) v (1) 9, 5 (1) v (2) 8	8·3
1921 Jan					
10	2700	,,	,,	5−1	8·2
13	2703	,,	,,	5 (2) v (3) 8	8·3
14	2704	45	Br	6−1	7·9
16	2706	55	Bo	6 (1) v (2) 7	7·9
25	2715	32	Ca	5−1, 9+2	8·2
31	2721	50	Bn	5 (4) v (1) 8	8·6
Feb					
4	2725	55	Bo	7 (3) v (1) 9	8·3
14	2735	32	Ca	=14	9·4
17	2738	50	Bn	13 (2) v (1) 15	9·4
19	2740	55	Bo	14 (1) v (3) 16	9·5
Mar					
2	2751	160	,,	31 (2) v (1) 34	11·5
2	2751	50	Bn	29 (1) v (2) 31	11·0
4	2753	80	Ca	29−2	11·2
13	2762	120	Br	34−5, 45+2·5	12·2
14	2763	,,	Bn	45 (2) v (1) 48	12·6
15	2764	55	Bo	42 (1) v (1) 45	12·3
30	2779	160	,,	52 (1) v (1) 54	13·2
31	2780	120	Bn	48 (2) v (1) 54, s (1) v (1) t	13·1
Apr					
4	2784	,,	Br	54+2	13·2
8	2788	,,	,,	54+1	13·3
1921 Apr					
11	2791	60	D	<34	<11·7*b*
15	2795	120	Br	54+2	13·2
19	2799	,,	Bn	<42	<12·2
21	2801	94	Li	<45	<12·4
28	2808	160	Bo	50 (1) v (3) 54	13·0*b*
28	2808	75	Bg	=42	12·2
28	2808	160	Br	45−5, 54+5	12·9
28	2808	120	Bn	42 (3) v (1) 48	12·6
28	2808	60	Ms	37−3	12·1*b*
May					
1	2811	120	Bn	=45, 48+4	12·4
8	2818	,,	,,	31 (1) v (2) 34	11·3
8	2818	75	Bg	29−1·5, 31+1	11·1
10	2820	160	Bo	31 (1) v (3) 34	11·3
10	2820	80	Ca	29−2	11·2
14	2824	55	Bg	26−4, 29+1	10·8
15	2825	120	Bn	26 (4) v (1) 29	10·9
19	2829	55	Bg	22−1, 26+5	9·9
19	2829	50	Bn	22 (2) v (1) 26	10·2
20	2830	55	Bo	14 (1) v (2) 22	9·6
21	2831	120	Bn	22−1	9·9
24	2834	,,	,,	22+1	9·7
24	2834	55	Bg	14−3, 22+1	9·7
25	2835	32	Ca	14−2, 22+2	9·6
28	2838	60	D	14−3, 22+2	9·7
June					
1	2842	55	Bg	=14	9·4
1	2842	160	Br	14−1, 22+2	9·6
1	2842	55	Bo	13 (1) v (2) 14	9·3
4	2845	32	Ca	1−1, 14+1	9·2*b*
5	2846	30	D	10−2, 1+1, 14+3	9·1
6	2847	48	Bg	8−5, 10−3, 14+2	9·2*b*
6	2847	50	Bn	11 (3) v (1) 13	9·1
7	2848	25	Ad	10 (2) v (1) 14	9·3*b*
11	2852	,,	,,	8 (1) v (1) 10	8·8
11	2852	55	Bg	8−2, =10	8·9
11	2852	50	Bn	8 (2) v (1) 11	8·8
11	2852	,,	Ma	8 (1) v (1) 19	9·3
14	2855	55	Bo	7 (2) v (1) 8	8·5
15	2856	30	Bn	8 (1) v (2) 11	8·7
16	2857	55	Bg	8−2, =10	8·9
16	2857	30	D	8−2, 10+1	8·9*b*
17	2858	,,	Bn	8+1	8·6
22	2863	55	Bg	7−4, 8+2	8·5
23	2864	25	Ad	=8	8·7*b*
23	2864	50	Bn	5 (4) v (1) 8	8·6
24	2865	30	D	8−1, 10+2	8·8*b*
26	2867	32	Ca	=8	8·7
27	2868	55	Bg	7−3, 8+3	8·4*b*
27	2868	45	Br	6−6, 8+3	8·4
27	2868	30	D	8+0·5	8·6
28	2869	,,	,,	=8	8·7
28	2869	,,	Bn	5 (4) v (1) 8	8·6
30	2871	55	Bg	7−4, 8+2	8·5
July					
4	2875	30	D	8−2, 10+1	8·9
5	2876	,,	,,	8−1, 10+1	8·8*b*
5	2876	55	Bg	7−5, 8+1	8·6
5	2876	50	Bn	5 (5) v (1) 8	8·6
8	2879	,,	,,	8 (1) v (3) 11	8·7
9	2880	30	D	8−2, 10+1	8·9
10	2881	55	Bg	8−1, 10+1	8·8
11	2882	30	D	10−1, 1+2	9·0
12	2883	50	Bn	8 (1) v (1) 11	8·8

Nov. 16, Bg, About.
April 8, Difficult.

April 19, t. Not seen.
April 28, Ms, t. Approximately.

(6512) T HERCULIS—*continued.*

1921					
July					
13	2884	80	Ca	=10	8·9*b*
20	2891	30	Bn	8 (3) v (2) 11	8·8
21	2892	55	Bg	10−1, 14+3·5	9·1
21	2892	30	D	10−2, 1+1, 14+4	9·1*b*
25	2896	,,	,,	=1, 14+3	9·1
25	2896	50	Bn	11 (1) v (1) 13	9·0
25	2896	64	Ad	8 (1) v (1). 14	9·1*b*
30	2901	30	D	1−3, =14	9·4
31	2902	64	Ad	14 (3) v (1) 22	9·7
31	2902	55	Bg	14−2, 22+2	9·6
Aug					
1	2903	30	D	14−2, 22+3	9·6
3	2905	,,	,,	14−2, 22+2	9·6
6	2908	,,	,,	14−3, 22+1	9·7*b*
6	2908	55	Bg	22−2, 26+4	10·0
7	2909	30	D	14−4, 22+1	9·8*b*
7	2909	50	Ma	14 (3) v (1) 22	9·7
8	2910	64	Ad	=29	11·0
8	2910	75	Bn	26+1	10·3*b*
9	2911	55	Bo	14 (3) v (1) 22	9·7
10	2912	60	D	22 (1) v (3) 29, 22−3	10·1*b*
13	2915	50	Ma	29+1	10·9
18	2920	75	Bg	29−1·5, 34+5	11·1
18	2920	150	Ad	31−1	11·3*c*
23	2925	60	D	<29	<11·0
23	2925	55	Bo	31 (1) v (3) 34	11·3
25	2927	75	Bn	34−3	12·0*b*
26	2928	80	Ca	29−5	11·5*b*
29	2931	50	Ma	=34	11·7
30	2932	160	Br	34−2·5, 45+5	11·9
30	2932	,,	Bo	36 (3) v (2) 42	12·0
Sept					
1	2934	120	D	[45+54]−3	12·3
1	2934	80	Ca	29−5	11·5
3	2936	50	Ma	34 (1) v (1) A	11·9
3	2936	85	Bn	42−1	12·3*b*
4	2937	55	Bo	42 (1) v (1) 45	12·3
6	2939	120	D	[45+54]−3	12·3
6	2939	,,	Br	=45	12·4
7	2940	75	Bg	45−1, 48+2	12·5
7	2940	85	Bn	45 (2) v (1) 48	12·6
20	2953	120	Br	45−1	12·5
21	2954	75	Bg	42−2, =45	12·4
21	2954	120	Bn	45 (3) v (1) 48	12·6
22	2955	60	D	<[45+54]	<12·3
23	2956	160	Bo	=50	12·8*b*
24	2957	120	Bn	45 (3) v (1) 48	12·6
25	2958	82	Ad	=43	12·3
25	2958	160	Bo	42 (3) v (1) 50	12·7
27	2960	120	Bn	45 (3) v (1) 48	12·6
29	2962	60	D	<[45+54]	<12·3*b*
29	2962	75	Bg	34−4, 42+1	12·1
30	2963	55	Bo	36 (1) v (1) 42	12·0*b*
Oct					
1	2964	82	Ad	=45	12·4*b*
1	2964	160	Br	45−1	12·5
2	2965	120	Bn	45 (2) v (1) 48	12·6
4	2967	82	Ad	34 (4) v (1) 45	12·2
5	2968	120	Bn	45 (3) v (2) 48	12·6
6	2969	55	Bo	39 (3) v (1) 42	12·2
6	2969	75	Bg	34−2, 42+3	11·9
1921					
Oct					
8	2971	120	Bn	45−1	12·5
9	2972	82	Ad	31 (3) v (1) 34	11·5*b*
9	2972	60	D	<31	<11·2
14	2977	160	Br	=31	11·2
16	2979	120	Bn	31 (3) v (2) 34	11·5
21	2984	32	Ca	29+1	10·9
23	2986	45	Br	22−4, 29+8	10·2
23	2986	120	Bn	26 (1) v (1) 29	10·7
23	2986	79	Ma	=22, 29+2	10·3
28	2991	65	Bg	14−1, 22+3	9·5*b*
30	2993	55	Bo	14 (1) v (3) 22	9·5
30	2993	120	Bn	14 (3) v (1) 22	9·7
Nov					
6	3000	50	,,	11 (1) v (4) 14	9·0
6	3000	45	Br	8−3, 14+4	9·0
10	3004	50	Bn	8 (2) v (1) 11	8·8
12	3006	,,	,,	8 (2) v (1) 11	8·8
17	3011	55	Bo	5 (2) v (1) 9	8·3
22	3016	,,	Bg	6−3, =7	8·1*b*
22	3016	32	Ca	5−1, 9+2	8·2
23	3017	55	Bo	6 (2) v (1) 5	8·0
23	3017	50	Bn	6 (2) v (1) 5	8·0
26	3020	25	Ad	6 (5) v (1) 8	8·0*b*
26	3020	55	Bo	6 (2) v (1) 5	8·0
27	3021	50	Bn	5+1, 9+4	8·0
29	3023	55	Bg	6−2, 7+1	8·0
29	3023	45	Br	=6	7·8
Dec					
4	3028	50	Bn	5 (1) v (4) 8	8·2
7	3031	55	Bg	6−1, 7+2	7·9*b*
13	3037	45	Br	=6	7·8
13	3037	50	Bn	5−1	8·2
17	3041	25	Ad	6 (1) v (1) 8	8·3
17	3041	48	Bg	6−2, 7+1	8·0
20	3044	50	Bn	5 (2) v (3) 8	8·3*b*
22	3046	,,	,,	5 (1) v (2) 8	8·3
23	3047	45	Br	=6	7·8
25	3049	30	Bn	7 (2) v (1) 9, 5 (1) v (1) 8	8·3
28	3052	75	,,	5 (5) v (2) 8, 9−1	8·5
29	3053	48	Bg	7−2, 8+4	8·3
31	3055	30	Bn	5 (4) v (1) 8	8·6
1922					
Jan					
2	3057	75	,,	8+1	8·6
3	3058	45	Br	8−3	9·0
10	3065	75	Bn	8 (3) v (1) 11	8·8
11	3066	160	Br	8−5, 14+3	9·2*b*
Feb					
5	3091	55	Bo	31 (1) v (2) 32	11·2
25	3111	275	,,	<37	<11·8*c*
27	3113	80	Ca	<29	<11·0
Mar					
21	3135	,,	,,	<29	<11·0
31	3145	120	Br	=31	11·2
Apr					
16	3161	55	Bo	10 (3) v (2) 14	9·2
17	3162	75	Bn	14 (1) v (1) 22, 15 (1) v (2) 18	9·7
19	3164	55	Bg	10−1, 14+4	9·0
19	3164	32	Ca	=14	9·4
20	3165	55	Bo	10 (3) v (2) 14	9·2
27	3172	30	Bn	8 (1) v (2) 11	8·7
29	3174	45	Br	6−6, 8+3	8·4

Aug. 18, Ad, Very difficult.
Aug. 29, ±.
Sept. 3, Ma. Mag. of star A estimated to be 34−4=12^{m}·1. Its position is 0^{s}, −7′
Sept. 22, 29, D, Estimated.

Oct. 23, Ma, ±.
Feb. 27, Mar. 21, Visible.

(6512) T HERCULIS—*continued.*

1922					
May					
2	3177	50	Bn	5 (3) v (1) 9	8·3
4	3179	55	Bo	5 (4) v (3) 8	8·4
4	3179	,,	Bg	7−1; 8+5	8·2*b*
5	3180	32	Ca	5−2, =9	8·3
13	3188	55	Bo	5 (2) v (1) 9	8·3
13	3188	,,	Bg	6−2, 7+1	8·0*b*
13	3188	50	Bn	5 (1) v (3) 8	8·2
15	3190	37	Lp	=6	7·8
19	3194	30	Bn	5 (1) v (2) 8	8·3
19	3194	32	Ca	6−2, 5+1	8·0*b*
20	3195	55	Bo	5 (1) v (3) 9	8·2
20	3195	,,	Bg	6−2, 7+1	8·0*b*
20	3195	31	D	=5	8·1
20	3195	37	Lp	=7	8·1*b*
23	3198	,,	,,	=7	8·1
23	3198	50	Bn	5 (2) v (1) 8	8·5
25	3200	45	Br	6−5, 8+3	8·4
26	3201	55	Bg	6−3, =7	8·1
26	3201	32	Ca	5−1, 9+3	8·1*b*
27	3202	25	Ad	6 (3) v (1) 8, =9	8·4
28	3203	55	Bo	5 (1) v (3) 9	8·2
28	3203	31	D	5−4, 8+3	8·4
28	3203	37	Lp	7 (2) v (2) 9	8·2*b*
June					
1	3207	55	Bg	7−2, 8+4	8·3
1	3207	50	Bn	5 (5) v (2) 8	8·5
4	3210	,,	,,	5 (3) v (1) 8	8·5
6	3212	25	Ad	6 (1) v (1) 8	8·3*b*
11	3217	,,	,,	=10	8·9
16	3222	55	Bo	10 (1) v (4) 14	9·0
17	3223	62	Wf	=12, 14+4, 18+6	9·1*b*
19	3225	55	Bg	10−1, 14+3	9·1
23	3229	32	Ca	=14	9·4*b*
July					
3	3239	55	Bg	14−3, 22+1	9·7
4	3240	32	Ca	=26	10·4
10	3246	160	Br	22−3, 29+9	10·1
17	3253	140	Bo	29 (1) v (1) 31	11·1
19	3255	55	Bg	29−3, 34+3	11·3
19	3255	120	Bn	29 (2) v (1) 31	11·1
20	3256	82	Ad	29 (3) v (1) 34	11·5*b*
21	3257	160	Br	29−1, 31+1	11·1
23	3259	150	Wf	34−2, 45+4	11·9
29	3265	140	Bo	31 (3) v (1) 34	11·5
30	3266	100	Lp	=34	11·7*b*
30	3266	150	Wf	34−6, =45	12·3
30	3266	120	Bn	=34	11·7
30	3266	160	Br	34−4, 45+4	12·0
31	3267	82	Ad	37 (2) v (1) 39	12·0*b*
31	3267	55	Bg	=42	12·2
Aug					
7	3274	75	,,	45−1, 48+2	12·5*b*
15	3282	150	Ad	<43	<12·3
16	3283	,,	Wf	45−4, 52+3	12·8
16	3283	75	Bg	48−3, 52+1	13·0
17	3284	...	Ma	=45	12·4
17	3284	100	Lp	=48	12·7*b*
19	3286	140	Bo	s (1) v (2) t	13·1
19	3286	120	Br	45−6, 54+3	13·0*b*
20	3287	150	Wf	=52, 54+1	13·2

May 15, 20, 23, Lp, Slightly ruddy.
May 28, Lp, Difficult owing to difference of colour of 7 and variable.
Aug. 15, Invisible.
Aug. 17, Lp, Difficult.
Aug. 19, Br, About.

1922					
Aug					
23	3290	55	Bg	45−2, 48+1	12·6
23	3290	85	Bn	45−2	12·6
23	3290	150	Wf	45−4, 54+4	12·9
23	3290	79	Ma	42 (1) v (1) 48	12·5
25	3292	120	Br	45−2	12·6
25	3292	150	Lp	45 (3) v (2) 48	12·6
27	3294	140	Bo	45 (1) v (5) s	12·5
27	3294	150	Wf	37−5, 39+3, 45+1	12·1
31	3298	75	Bg	34−1, 42+5	11·7*b*
Sept					
7	3305	150	Wf	29 (1) v (1) 31	11·1
9	3307	100	Lp	29 (2) v (3) 31	11·0*b*
11	3309	64	Ad	26 (1) v (1) 29	10·7*b*
11	3309	62	Wf	22−7, 29+3	10·6*b*
11	3309	75	Bn	26 (4) v (1) 29	10·9
13	3311	60	Kw	25 (4) v (1) 29, =28	10·9
14	3312	150	Wf	=22, 25+4	10·0
15	3313	100	Lp	=22	9·8*b*
15	3313	75	Bn	22 (2) v (1) 26	10·2
16	3314	62	Wf	14−4, =22	9·8
17	3315	100	Lp	=22	9·8
18	3316	64	Ad	14 (1) v (3) 22	9·5*b*
19	3317	62	Wf	14−3, 22+2	9·7
20	3318	55	Bg	10−4, 14+1	9·3
20	3318	50	Bn	14 (1) v (3) 22	9·5
20	3318	37	Lp	11 (2) v (2) 15	9·2
20	3318	60	Kw	14 (2) v (2) 22, 16+1	9·6
22	3320	45	Br	14+1	9·3
23	3321	62	Wf	10−3, 14+2	9·2
24	3322	64	Ad	13 (2) v (1) 14	9·4*b*
24	3322	55	Bg	14−1, 22+3	9·5*b*
24	3322	50	Bn	13 (1) v (2) 14	9·3
24	3322	37	Lp	9 (2) v (2) 15, =11	8·9*b*
26	3324	,,	,,	9 (2) v (1) 14, =11	9·0*b*
29	3327	55	Bg	14−2, 22+2	9·6*b*
29	3327	50	Bn	11 (2) v (1) 13	9·1
29	3327	37	Lp	9 (2) v (2) 13, =11	8·8*b*
Oct					
5	3333	62	Wf	8−3, =10	9·0
6	3334	50	Bn	8 (3) v (1) 11	8·8
6	3334	37	Lp	9 (2) v (1) 11	8·7*b*
7	3335	100	,,	9 (2) v (2) 11	8·6
11	3339	55	Bg	8−2, =10	8·9
11	3339	60	Kw	8−1, =11	8·8*b*
12	3340	50	Bn	5 (2) v (1) 8	8·5
12	3340	37	Lp	=9	8·4
12	3340	34	Li	7 (8) v (2) 8	8·6
13	3341	60	Kw	=8	8·7*b*
13	3341	25	Ad	8 (1) v (1) 10	8·8
14	3342	,,	,,	6 (3) v (1) 10, 5 (2) v (1) 11	8·6
14	3342	55	Bo	5 (2) v (1) 9	8·3
14	3342	45	Br	6−6, 8+3	8·4
14	3342	50	Bn	5 (5) v (2) 8	8·5
14	3342	62	Wf	6 (1) v (1) 8	8·3*b*
15	3343	34	Li	7 (4) v (6) 8	8·3
15	3343	37	Lp	7 (2) v (2) 9	8·2*b*
15	3343	60	Kw	5−3, 9−1, 8+2	8·5
15	3343	31	D	5−3·5, 8+2·5	8·4
16	3344	55	Bg	7−2, 8+4	8·3
16	3344	50	Bn	5 (3) v (1) 8	8·5
17	3345	34	Li	7 (2) v (8) 8	8·2
17	3345	60	Kw	6 (1) v (4) 14, 6−4	8·2
18	3346	50	Bn	5 (3) v (1) 8	8·5

Sept. 13, 20, Oct. 11, 13, 15, 17, Kw, t.

(6512) T HERCULIS—*continued.*

1922 Oct					
21	3349	37	Lp	6 (4) v (1) 7	8·0
22	3350	60	Kw	6−3, 5+2	8·0*b*
22	3350	31	D	6−1, 5+0·5, 9+4	8·0
22	3350	50	Bn	5 (2) v (1) 8	8·5
22	3350	25	Ad	6 (1) v (4) 8, =5	8·0
24	3352	37	Lp	6 (4) v (1) 7	8·0*b*
25	3353	25	Ad	=5	8·1
25	3353	75	Pr	4−4, 6+1	7·6
26	3354	37	Lp	6 (2) v (1) 7	8·0*b*
28	3356	,,	,,	6 (2) v (2) 7	8·0
28	3356	50	Bn	4 (5) v (1) 6	7·7
28	3356	55	Bo	4 (3) v (3) 6	7·5
Nov					
1	3360	62	Wf	=4	7·2
1	3360	37	Lp	6 (2) v (2) 7	8·0*b*
1	3360	70	Gr	4−5, 8+10	7·7
1	3360	45	Br	=4	7·2
2	3361	55	Bg	=6, 7+3	7·8
4	3363	48	,,	6−1, 7+2	7·9
4	3363	25	Ad	=6	7·8
4	3363	50	Bn	4 (3) v (1) 6	7·7
4	3363	75	Pr	4−3, 6+3	7·5*b*
7	3366	50	Bn	4 (3) v (1) 6	7·7
9	3368	37	Lp	=7	8·1*b*
10	3369	70	Gr	4−2	7·4
11	3370	45	Br	4−2, 6+4	7·4
11	3370	37	Lp	7+1	8·0*b*
13	3372	75	Pr	4−6, 6+1	7·7*b*
13	3372	50	Bn	4 (3) v (1) 6	7·7
15	3374	,,	,,	6+1	7·7
17	3376	70	Gr	4−5	7·7
23	3382	37	Lp	9 (2) v (2) 8	8·5*b*
24	3383	45	Br	6−4, 8+4	8·3
24	3383	50	Bn	5 (5) v (1) 8	8·6
25	3384	48	Bg	7−5, 8+1	8·6*b*
29	3388	50	Bn	8 (3) v (1) 11	8·8
Dec					
11	3400	45	Br	14−2, 22+2	9·6
16	3405	100	Lp	=22	9·8*b*
18	3407	120	Bn	26 (3) v (1) 29	10·8*b*
19	3408	75	Pr	14−4, =22	9·8
20	3409	,,	,,	22−3	10·1*b*
20	3409	65	Bg	=29	11·0*b*
20	3409	150	Lp	29 (2) v (2) 31	11·1
23	3412	75	Pr	=29	11·0*b*
23	3412	120	Bn	29 (2) v (1) 31	11·1
26	3415	85	,,	=31	11·2
26	3415	150	Pr	29−2, =31	11·2*b*
1923 Jan					
8	3428	75	Bn	<31	<11·2
10	3430	150	Pr	<36	<11·8*c*
20	3440	85	Bn	42−3	12·5*b*
Feb					
7	3458	157	Wf	=37	11·8
11	3462	75	Pr	29−2, =31	11·2
Mar					
17	3496	,,	,,	12−2, 14+1	9·3*b*
19	3498	31	D	8−1, 10+1, 14+4	8·9
26	3505	75	Pr	8−3, 12+1	9·0

Oct. 21, Yellowish.
Oct. 22, Kw, t.
Oct. 25, Pr, Deep orange.
Nov. 9, Rather ruddy.
Dec. 23, Pr, Difficult to estimate. Bn, t.
Jan. 8, Not seen.
Jan. 10, Barely glimpsed.

1923 Apr					
6	3516	62	Wf	4−3, 6+2	7·5
8	3518	75	Pr	=6	7·8
8	3518	37	Lp	=6	7·8
10	3520	62	Wf	4−2, 6+3	7·4
13	3523	30	Bn	4+1	7·1
13	3523	37	Lp	4 (2) v (1) 6	7·6
14	3524	34	Li	4 (2) v (8) 5	7·4
14	3524	48	Bg	6−2, 7+1	8·0
15	3525	62	Wf	4−3, 6+5	7·4
19	3529	30	D	6−1, 5+3	7·9
20	3530	55	Bg	6 (1) v (2) 7	7·9*b*
22	3532	62	Wf	4−1, 6+5	7·3
23	3533	30	D	=6	7·8
26	3536	37	Lp	7 (2) v (2) 9	8·2*b*
26	3536	30	Bn	6 (1) v (1) 5	8·0
27	3537	,,	D	=6	7·8
May					
2	3542	62	Wf	4−6, 6+2	7·7
3	3543	55	Bg	7 (1) v (2) 8	8·3*b*
3	3543	45	Br	6−3, 8+6	8·1
3	3543	37	Lp	=9	8·4
4	3544	30	Bn	5 (1) v (2) 8	8·3
4	3544	75	Pr	6−2, 7+1	8·0
5	3545	30	D	5−3, 8+3	8·4
5	3545	37	Lp	9 (2) v (2) 8	8·5*b*
7	3547	62	Wf	6−4, 8+3	8·3
10	3550	60	D	9−2, 8+1	8·6
11	3551	75	Pr	7−2, 9+1	8·3
11	3551	37	Lp	9 (2) v (2) 10, 9 (1) v (3) 13	8·6
11	3551	55	Bg	7 (1) v (1) 8	8·4
13	3553	30	D	10−1, 1+2	9·0
14	3554	60	,,	=10	8·9
16	3556	120	Bn	8 (1) v (1) 11	8·8
16	3556	37	Lp	=11	8·9*b*
20	3560	62	Wf	10−4, 14+2	9·3
21	3561	50	Bn	13 (2) v (1) 15	9·4
24	3564	60	D	14−2, 22+2	9·6
24	3564	75	Pr	=14, 22+4	9·4*b*
25	3565	100	Lp	14 (2) v (2) 22, =18	9·7*b*
June					
3	3574	150	Wf	29 (1) v (1) 31	11·1
6	3577	60	D	29−1	11·1
9	3580	150	Wf	29−3, 31−1, 34+5	11·2
9	3580	...	Gr	=29	11·0
10	3581	100	Lp	29 (4) v (1) 31	11·1*b*
10	3581	60	D	32−1, 34+1	11·5
11	3582	120	Bn	31 (2) v (1) 34	11·5
11	3582	75	Pr	=29, 31+3	10·9
17	3588	150	Lp	=34	11·7*c*
18	3589	120	D	34−3	12·0
22	3593	150	Lp	=48	12·7*b*
July					
1	3602	157	Wf	52−1, 54+1	13·2
2	3603	150	Lp	=48	12·7*b*
4	3605	,,	,,	48−2	12·9*b*
5	3606	110	Bg	=42	12·2*b*
6	3607	60	D	(45+54)−3	12·3*b*
6	3607	150	Lp	48 (2) v (2) 52	12·9*c*
8	3609	,,	,,	=54	13·4
8	3609	157	Wf	54−2	13·6
8	3609	120	Bn	48 (3) v (1) 54	13·2

April 8, Pr, Reddish orange.
April 14, Li, Faint orange.
June 17, July 2, Difficult.
July 5, About.

(6512) T HERCULIS—*continued.*

1923					
July					
12	3613	60	D	<s	<13·0
15	3616	150	Wf	=54	13·4
18	3619	,,	Lp	=52	13·1*b*
20	3621	,,	,,	=52	13·1*b*
21	3622	120	Bn	48−3	13·0
21	3622	193	Li	45 (7) v (3) 54	13·1
22	3623	157	Wf	45−6, 52+1	13·0
26	3627	150	Lp	=45	12·4*c*
Aug					
2	3634	75	Bg	34 (2) v (1) 42	12·0
3	3635	160	Br	34−2·5, 45+5	11·9
3	3635	120	Bn	31 (3) v (1) 34	11·5
6	3638	150	Wf	29−6, =34	11·6
8	3640	75	Bg	31 (3) v (2) 34	11·5
8	3640	120	Bn	29 (2) v (1) 31	11·1
11	3643	,,	,,	26 (5) v (1) 29	10·9
11	3643	100	Lp	=29	11·0*b*
11	3643	120	D	29−2	11·2
12	3644	157	Wf	29−2, =31	11·2
13	3645	100	Lp	=27	10·8
15	3647	150	Wf	29+1, 31+3	10·9
15	3647	120	Bn	26+1	10·3
15	3647	100	Lp	25 (2) v (2) 27	10·6
18	3650	,,	,,	22 (2) v (2) 24	10·1*b*
21	3653	37	,,	=22	9·8*b*
22	3654	75	Bg	=14	9·4
26	3658	100	Lp	=14	9·4*b*
28	3660	50	Bn	13 (3) v (2) 15	9·4
29	3661	62	Wf	10−2, 14+3	9·1
30	3662	...	Gr	10+1	8·8
30	3662	37	Lp	=11	8·9*b*
31	3663	75	Pr	12−1, 14+1	9·3
Sept					
1	3664	45	Br	8−2·5, 14+5	8·9
1	3664	30	D	10−1, 1+2	9·0
3	3666	,,	,,	10−2, 1+2	9·0
3	3666	37	Lp	=8	8·7*b*
5	3668	50	Ma	6 (4) v (1) 14	9·1
5	3668	,,	Bn	8 (2) v (1) 11	8·8
5	3668	37	Lp	8 (1) v (2) 11	8·7
7	3670	,,	,,	9 (2) v (2) 8	8·5
7	3670	62	Wf	8−5, 14+3	9·2
8	3671	30	D	=10	8·9
8	3671	55	Bg	10 (1) v (4) 14	9·0
9	3672	37	Lp	9 (2) v (3) 8	8·5
9	3672	75	Pr	9−1, 8+1, 10+3	8·6
10	3673	45	Br	8+1	8·6
11	3674	37	Lp	=9	8·4
11	3674	50	Bn	8 (1) v (3) 11	8·7
12	3675	62	Wf	5−5, 8+2	8·5
12	3675	30	D	8−1, 10+2	8·8
13	3676	55	Bg	7 (3) v (1) 8	8·5
15	3678	50	Bn	9 (1) v (1) 8	8·5
15	3678	37	Lp	7 (1) v (2) 9	8·2
16	3679	50	Ma	4−3, 6−2, 14+3, 22+5	8·5
17	3680	37	Lp	7 (2) v (2) 9	8·2*b*
17	3680	55	Bg	7 (2) v (1) 8	8·5
18	3681	30	D	5−2, 8+4	8·3
21	3684	75	Pr	7−1, 9+2	8·2*b*
21	3684	37	Lp	7 (1) v (4) 9	8·2*b*
21	3684	50	Bn	7 (2) v (1) 9, 5+1	8·2
22	3685	62	Wf	6−5, 8+3	8·4

July 12, Glimpsed.
July 20, Difficult.
July 26, Doubtful.
Sept. 21, Pr, Yellow.

1923					
Sept					
28	3691	...	Gr	6−2	8·0
29	3692	45	Br	6−2	8·0
29	3692	50	Bn	7 (2) v (1) 9, 8+4	8·3
30	3693	30	D	5−3, 8+3	8·4
30	3693	F	Wf	6−5, 8+3	8·4
30	3693	75	Pr	7−1, 9+2	8·2
30	3693	37	Lp	7 (2) v (2) 9	8·2*b*
30	3693	55	Bg	6 (3) v (1) 7	8·0
Oct					
4	3697	37	Lp	6 (3) v (2) 7	8·0
4	3697	50	Bn	5 (3) v (1) 8, 9−1	8·5
6	3699	48	Bg	7 (1) v (3) 8	8·2
8	3701	62	Wf	6−4, 8+4	8·3
12	3705	45	Br	6−2	8·0
12	3705	50	Ma	6 (2) v (1) 14	8·9
13	3706	30	D	5−3; 8+2	8·4*b*
13	3706	37	Lp	5 (2) v (2) 7	8·1*b*
14	3707	50	Bn	5 (3) v (1) 8	8·5
14	3707	75	Pr	7−3, =9	8·4
15	3708	55	Bg	7 (1) v (2) 8	8·3
21	3714	75	Pr	7−2, 8+2	8·4*b*
21	3714	50	Ma	6−4, 14+4	8·6
22	3715	,,	Bn	8 (1) v (2) 11	8·7
25	3718	55	Bg	8−2, =10	8·9*b*
28	3721	50	Bn	8 (2) v (1) 11	8·8
28	3721	37	Lp	8 (2) v (2) 10	8·8*b*
30	3723	...	Gr	=8	8·7
30	3723	62	Wf	10−3, 14+2	9·2
31	3724	45	Br	8−1	8·8
Nov					
2	3726	37	Lp	11 (2) v (2) 13	9·0*b*
3	3727	100	,,	=13	9·2
3	3727	50	Bn	13 (2) v (1) 14	9·3
4	3728	30	D	1−1, 14+1	9·3
7	3731	75	Pr	12−2, 14+3	9·2
7	3731	50	Bn	14 (2) v (1) 22	9·7
8	3732	55	Bg	14 (1) v (3) 22	9·5*b*
10	3734	60	D	14−3, 22+2	9·7
10	3734	79	Ma	22+2	9·6
10	3734	100	Lp	14 (2) v (1) 22, =18	9·7*b*
10	3734	50	Bn	22+1	9·7
14	3738	,,	,,	22+1	9·7
15	3739	55	Bg	14 (4) v (1) 22	9·7
16	3740	45	Br	14−1, 22+2	9·6
17	3741	100	Lp	22 (2) v (2) 31	10·5*b*
18	3742	50	Bn	22 (2) v (1) 26	10·2
23	3747	120	,,	29 (2) v (1) 31	11·1
30	3754	,,	,,	34 (3) v (2) 42	12·0
30	3754	150	Wf	34−3, 42+2	12·0
30	3754	160	Br	31−1, 34+3	11·3
Dec					
2	3756	75	Pr	31−2, 34+2	11·4
3	3757	120	Bn	34 (4) v (1) 42	12·1
9	3763	150	Lp	<45	<12·4*b*
11	3765	157	Wf	45−3, 52+4	12·7
16	3770	120	Bn	45−4, =48	12·8
18	3772	,,	Br	45−3	12·7
1924					
Jan					
2	3787	80	Ry	39−1·5, =45	12·3*b*
3	3788	120	Br	45−3	12·7*b*
6	3791	,,	Bn	42 (3) v (1) 45	12·4
11	3796	80	Ry	=34, 37+1	11·7

Oct. 12, Ma, Red.
Dec. 9, Glimpsed.
Jan. 3, About.

(6512) T HERCULIS—*continued.*

1924 Jan					
14	3799	120	Bn	29 (3) v (1) 31	11·1
15	3800	60	D	<29	<11·0*b*
27	3812	50	Ry	14−5, =22, 25+4	9·9
Feb					
1	3817	,,	Bn	14 (3) v (1) 22	9·7
1	3817	30	D	=14	9·4
3	3819	50	Ry	14+2	9·2*b*
7	3823	30	,,	=11, 14+1	9·1
8	3824	62	Wf	8−3, =10	9·0
8	3824	30	D	10−2, 1+1	9·1
14	3830	,,	,,	=10	8·9
14	3830	50	Bn	9 (1) v (1) 8	8·5
16	3832	,,	,,	9 (1) v (2) 8	8·5
23	3839	20	Ry	7−4, 8+2	8·5
28	3844	,,	,,	6−1·5, 7−2·5	8·2*b*
Mar					
4	3849	,,	,,	6−2, 7−2	8·2
4	3849	30	D	=5	8·1
4	3849	50	Bn	6 (2) v (1) 5	8·0
8	3853	,,	,,	4−4, 6+2	7·6
8	3853	100	Lp	=6	7·8
8	3853	30	D	6−2, 5+1	8·0
10	3855	,,	,,	6−1, 5+2	7·9
10	3855	,,	Bn	6 (5) v (2) 5	8·0
11	3856	20	Ry	6−1, 7−1	8·1
12	3857	30	Bn	6 (1) v (1) 5	8·0
13	3858	50	,,	5−1	8·2
15	3860	20	Ry	6−2·5, 7−3·5, 8+4·5	8·3
29	3874	37	Lp	9 (1) v (2) 11	8·5*b*
29	3874	30	Bn	9 (1) v (2) 8	8·5
30	3875	,,	D	=10	8·9
30	3875	60	Kw	6 (1) v (1) 14, 13+1	8·8*b*
Apr					
1	3877	50	Bn	9 (2) v (1) 8	8·6
1	3877	37	Lp	=11	8·9
3	3879	30	Ry	=10, 11+1·5	8·8
4	3880	,,	D	10−2, 1+2, 14+4	9·0
4	3880	50	Bn	=8	8·7
7	3883	,,	,,	8 (2) v (1) 11	8·8
7	3883	55	Bg	7 (2) v (1) 8	8·5
7	3883	100	Lp	11 (2) v (2) 13	9·0*b*
8	3884	60	Kw	12+1, 14+4	9·0
9	3885	30	Bn	11 (2) v (1) 13	9·1
11	3887	,,	D	1−2, 14+1	9·3
15	3891	,,	Ry	14−1·5, 18+3, 22+4	9·5
20	3896	100	Lp	=22	9·8*b*
20	3896	50	Bn	14 (2) v (1) 22	9·7
24	3900	80	Ry	=22, 25+3	10·0
24	3900	62	Wf	14−3, 22+1	9·7
30	3906	150	,,	29+1, 31+2	10·9
May					
1	3907	60	Kw	26−4, 31+1	10·9
1	3907	120	Bn	26 (1) v (1) 29	10·7
4	3910	,,	D	=29	11·0
5	3911	75	Bg	26 (3) v (1) 29	10·8
5	3911	120	Bn	29 (1) v (1) 31	11·1
7	3913	,,	D	29−2	11·2

Jan. 27, Feb. 3, 7, T.
Feb. 23, 28, Mar. 4, Ry. t.
Mar. 8, D, 4^c.
Mar. 10, D, 3^c.
Mar. 11, 15, April 3, 15, t.
Mar. 30, April 8, May 1, Kw, T.

1924 May					
7	3913	50	Ry	29−2, 31−1	11·2*b*
9	3915	80	,,	29−3, 31+1, 34+3	11·2
9	3915	120	D	29−1, 31+1	11·1
12	3918	150	Wf	29−4, 31−2	11·4
16	3922	120	Bn	34 (1) v (3) 42	11·8
19	3925	,,	,,	34 (4) v (1) 42	12·1
20	3926	150	Lp	34 (2) v (2) 36	11·7*b*
20	3926	170	Ry	37−2, 45+2	12·1*b*
23	3929	150	Wf	34−6, 45+3	12·2
23	3929	120	D	34−2, [45+54]+2	11·8
27	3933	,,	,,	=45	12·4
27	3933	80	Ry	45−1	12·5*b*
27	3933	150	Lp	42 (2) v (2) 48	12·5*b*
27	3933	120	Bn	45 (1) v (4) 48	12·5
27	3933	60	Kw	34−4, 37 (1) v (1) 45, 45+3	12·1
28	3934	157	Wf	34−4, 45+2	12·1
30	3936	75	Bg	34 (1) v (1) 42	11·9*b*
30	3936	120	D	=45	12·4
June					
2	3939	150	Wf	37−4, 45+1	12·2
5	3942	120	D	34−5, 45+2	12·2
8	3945	60	Kw	39−1, 45+2	12·2*b*
19	3956	150	Lp	31 (2) v (2) 34	11·4*b*
20	3957	120	Bn	31 (4) v (1) 34	11·6
20	3957	170	Ry	31−2, =37	11·6*b*
21	3958	120	D	31−4, 34+1	11·6
23	3960	150	Wf	29−4, 37+3	11·4
24	3961	55	Bg	=29	11·0
26	3963	120	D	29−1, 31+2	11·0
26	3963	50	Ry	29−2, 31+1, 37+3	11·2
27	3964	150	Wf	29−0·5, 31+2	11·0
29	3966	60	D	29+1	10·9*b*
30	3967	75	Bg	26 (1) v (2) 29	10·6
30	3967	100	Lp	=26	10·4*b*
July					
1	3968	60	D	24−3, 29+2	10·7
3	3970	150	Wf	26−3, 29+2	10·7
6	3973	75	Bg	14 (1) v (1) 22	9·6*b*
6	3973	60	D	=22	9·8
7	3974	150	Wf	=22	9·8
9	3976	60	D	14−4, 22+1	9·8
10	3977	62	Wf	14−4, =22	9·8
10	3977	50	Bn	14 (2) v (1) 22	9·7
10	3977	75	Bg	14 (1) v (1) 22	9·6
12	3979	100	Lp	13 (1) v (2) 14	9·3*b*
13	3980	60	D	14−2, 22+3	9·6
14	3981	50	Bn	13−2, 14+1	9·4
15	3982	75	Bg	14 (1) v (4) 22	9·5
19	3986	55	,,	10 (3) v (1) 14	9·3*b*
19	3986	50	Bn	11 (1) v (1) 13	9·0
19	3986	37	Lp	11 (2) v (2) 14, =12	9·1*b*
19	3986	50	Ry	=14	9·4*b*
22	3989	62	Wf	10−1, 14+3	9·1
24	3991	37	Lp	=8	8·7*b*
24	3991	50	Bn	8 (1) v (2) 11	8·7
24	3991	55	Bg	10 (1) v (4) 14	9·0
25	3992	30	Ry	=10, 14+3	9·0
27	3994	62	Wf	6−7, 11+3	8·5
29	3996	50	Bn	5 (5) v (1) 8	8·6
31	3998	30	,,	5−4, 8+2	8·5
31	3998	60	D	5−1, 8+4	8·2*b*

May 7, Ry, t.
May 20, 27, Lp, Difficult.
May 27, June 8, Kw, T.
June 26, July 19, Ry, T.
July 25, t.

(6512) T HERCULIS—*continued.*

1924					
Aug					
1	3999	62	Wf	6−2	8·0
2	4000	50	Bn	5−3, 8+3	8·4
3	4001	20	Ry	4−5, 6−4, 5−2	8·1
5	4003	50	Bn	5−1, 8+5	8·2
6	4004	62	Wf	4−3, 6+4	7·4
7	4005	55	Bg	4 (4) v (1) 6	7·7
7	4005	50	Bn	6+1	7·7
7	4005	79	Ma	=4	7·2
8	4006	30	D	4−4, 6+2, 5+5	7·6
9	4007	55	Bg	4 (3) v (1) 6	7·7
10	4008	62	Wf	4−0·5	7·2
10	4008	30	D	4−4, 6+2	7·6
12	4010	50	Bn	4 (4) v (1) 6	7·7
13	4011	60	D	4−3, 6+3	7·5
16	4014	160	Br	4+2	7·0
17	4015	30	D	4−3, 6+2	7·5
18	4016	35	Ry	4−1·5, 6−2, =5	7·8
18	4016	50	Ma	4 (1) v (1) 6	7·5
18	4016	100	Lp	=6	7·8*b*
18	4016	55	Bg	4 (3) v (1) 6	7·7*b*
19	4017	50	Bn	4 (5) v (1) 6, 6+2	7·7
21	4019	60	D	4−4, 6+2	7·6
22	4020	62	Wf	=6	7·8
22	4020	55	Bg	4 (4) v (1) 6	7·7
25	4023	30	Bn	4 (3) v (1) 6	7·7
26	4024	F	Wf	=6	7·8
27	4025	55	Bg	4 (4) v (1) 6	7·7*b*
27	4025	60	D	6−2, 5+1	8·0
28	4026	20	Ry	4−3, 6−3, 5−2, 7+2	7·9
31	4029	F	Wf	6 (3) v (2) 5	8·0
31	4029	37	Lp	=7	8·1*b*
31	4029	30	Bn	6 (1) v (2) 5	7·9
31	4029	55	Bg	7 (1) v (3) 8	8·2
Sept					
5	4034	60	D	5−4, 8+2	8·5
5	4034	50	Bn	6 (2) v (1) 5	8·0
5	4034	,,	Ma	=6	7·8
7	4036	62	Wf	6−2, 8+5	8·1
9	4038	50	Ma	4−7, 6 (1) v (1) 14, 6−4, 14+5	8·5
9	4038	,,	Bn	5−1, 9+2	8·2
10	4039	40	D	5−5, 8+1	8·6
11	4040	37	Lp	7 (2) v (2) 9	8·2
11	4040	30	Bn	=9	8·4
14	4043	50	,,	9 (1) v (1) 8	8·5
16	4045	35	Ry	10+2, 11+4	8·6
22	4051	60	D	1−2, 14+1	9·3

Aug. 3, 28, t.
Aug. 7, Ma, Pale yellow.
Aug. 10, D, 5^{c}.
Sept. 5, Bn, 8½-in. reflector.

1924					
Sept					
22	4051	50	Bn	11+0·5	8·8
22	4051	55	Bg	10 (3) v (1) 14	9·3
22	4051	37	Lp	14 (1) v (4) 22	9·5*b*
23	4052	,,	,,	14 (1) v (2) 22	9·6
23	4052	60	Kw	14 (1) v (4) 22, 14−1	9·5
26	4055	,,	D	14−3, 22+3	9·6
26	4055	62	Wf	14−3, 22+1	9·7
27	4056	50	Bn	13 (4) v (1) 15	9·5
27	4056	45	Br	14+2	9·2
29	4058	79	Ma	22+3, 29+6	9·9
Oct					
3	4062	100	Lp	22 (2) v (2) 29	10·4*b*
5	4064	62	Wf	29+1, 31+3	10·9
6	4065	160	Br	22−8, 29+4	10·6
8	4067	120	Bn	26 (3) v (1) 29	10·8
8	4067	75	Bg	29 (1) v (4) 34, =31	11·1
8	4067	80	Ry	=29	11·0*b*
13	4072	,,	,,	31−5, 37+3	11·5*b*
13	4072	50	Bn	31 (3) v (1) 34	11·5
16	4075	157	Wf	37−3, 45+5	12·0
19	4078	120	Bn	34 (3) v (1) 42	12·1
22	4081	,,	,,	34 (4) v (1) 42	12·1
23	4082	150	Lp	[45+54] (2) v (2) 52	12·6*b*
23	4082	120	Br	34−4, 45+4	12·0*b*
23	4082	80	D	[45+54]+1	11·9
30	4089	75	Bg	45 (1) v (2) 48	12·5*b*
Nov					
3	4093	120	Br	45−4	12·8
3	4093	,,	Bn	42−5, 45−3, =48	12·7
3	4093	193	Li	45 (7) v (3) 52	12·9*c*
4	4094	80	D	[45+54]−5	12·5*b*
16	4106	120	Bn	45−4, =48	12·8
16	4106	130	Ma	45 (1) v (1) 54, t+1	13·0*b*
17	4107	193	Li	<54	<13·4*b*
27	4117	120	Bn	45−4, =48, s+1	12·8
30	4120	,,	,,	45 (3) v (1) 48	12·6
Dec					
5	4125	,,	,,	45−3	12·7*b*
9	4129	,,	,,	42 (1) v (1) 45	12·3
14	4134	,,	,,	34 (3) v (1) 42	12·1
14	4134	94	Li	39 (5) v (5) 43	12·2*b*
24	4144	120	Bn	29 (2) v (1) 31	11·1
28	4148	,,	,,	=29	11·0
30	4150	60	D	=29	11·0
31	4151	75	Bg	26 (1) v (1) 29	10·7*b*

Sept. 23, Kw, T.
Oct. 13, Ry, Half-weight for first estimate.
Nov. 3, Br, About. Li, Difficult.
Nov. 4, Difficult.
Nov. 16, Ma, Difficult.
Nov. 17, Var. held.
Dec. 14, Li, Difficult.

(5889) U HERCULIS. (V. 4.)

H.D. 162119.

Date.	Julian Date.	Inst.	Observer.	Comparisons.	Deduced Mag.
1919					
May					
8	2087	60	D	<15	<11·6
18	2097	,,	,,	<15	<11·6
23	2102	,,	,,	15−7	12·3*b*
June					
17	2127	,,	,,	<15	<11·6
July					
7	2147	,,	,,	<15	<11·6
16	2156	,,	,,	<11	<10·9
Aug					
7	2178	,,	,,	<11	<10·9
18	2189	,,	,,	15−6	12·2
24	2195	,,	,,	15−2	11·8
Sept					
7	2209	,,	,,	=15	11·6*b*
16	2218	,,	,,	11−5, 15+2	11·4
29	2231	30	,,	5−4, q+2	9·6
Oct					
11	2243	,,	,,	k−3, 2+1	8·1*b*
20	2252	,,	,,	k−1·5, 2+2·5	8·0
1920					
Feb					
16	2371	60	,,	11−3, 15+3	11·2
Mar					
18	2402	,,	,,	11−4, 15+2	11·3
Apr					
13	2428	,,	,,	15−4	12·0
June					
9	2485	120	Br	28−5	13·7
July					
18	2524	160	,,	15−3, =17	12·0
20	2526	60	D	<15	<11·6
Aug					
6	2543	120	Br	13−2, 15+1	11·5
Sept					
10	2578	75	Gi	10−2, 12+1	10·8
12	2580	60	D	=15	11·6
Oct					
1	2599	160	Br	11−1, 13+3	11·0
7	2605	117	Gi	10−1, 11+3	10·5
9	2607	60	D	11−3, 15+2	11·3
24	2622	,,	,,	11+4	10·5*b*
27	2625	117	Gi	5−4·5	9·7*c*
29	2627	160	Br	5−1	9·4
Nov					
1	2630	30	D	5−2, q+4	9·4
14	2643	75	Gi	A−7, 2+4	7·9
1921					
Jan					
6	2696	45	Bh	=1	7·3
10	2700	,,	,,	=1	7·3
13	2703	,,	,,	1−3, 2+7	7·5
19	2709	47	Gi	1−8, 2+4	7·9*b*
1921					
Jan					
24	2714	45	Bh	1−7, 2+3	7·9
25	2715	32	Ca	=2	8·2
30	2720	45	Bh	=2	8·2
Feb					
1	2722	,,	,,	=2	8·2
4	2725	47	Gi	3−2·5, 4+3	8·6*b*
9	2730	90	Bh	3−3, 5+7	8·6
12	2733	45	,,	3−5, 5+5	8·8
13	2734	32	Ca	4−1, 5+3	9·0
17	2738	45	Bh	3−5, 5+5	8·8*b*
21	2742	90	,,	3−7, 5+3	9·0
21	2742	47	Gi	3−4, 4+1	8·8
25	2746	90	Bh	5+2	9·1
Mar					
2	2751	45	,,	5+2	9·1
4	2753	32	Ca	=5	9·3
6	2755	90	Bh	5+1	9·2
11	2760	,,	,,	5+1	9·2
14	2763	45	,,	=5	9·3
14	2763	47	Gi	4−2, 5+1·5	9·2
21	2770	45	Bh	5−3, 10+8	9·6*b*
23	2772	90	,,	5−2, 9+10	9·5
29	2778	,,	,,	5−4, 10+6	9·7
Apr					
1	2781	45	,,	8−1	10·0
2	2782	47	Gi	5−2, q+2	9·5
3	2783	30	D	q−2, 10+4	10·0
7	2787	45	Bh	5−8, 10+2	10·1
8	2788	32	Ca	8−1, 10+4	10·0
9	2789	90	Bh	=10	10·4*b*
11	2791	60	D	q−3, 10+3	10·1
12	2792	45	Bh	10+2, 11+7	10·2
14	2794	60	Ms	10+3	10·1
15	2795	,,	,,	10+2	10·2
15	2795	,,	D	q−4, 10+2	10·2
16	2796	150	Wf	5−3, 11+7	9·9*b*
19	2799	90	Bh	10+2	10·2
24	2804	150	Wf	5 (2) v (1) 10	10·0*b*
25	2805	90	Bh	10−5, 11+1	10·8*b*
27	2807	,,	,,	11+1, 13+6	10·7
27	2807	47	Gi	q−3, 10+2·5	10·1
28	2808	60	D	q−3, 10+3	10·1
29	2809	45	Bh	=10, 11+3	10·5
May					
5	2815	150	Wf	5−4, 10+1	10·0
5	2815	80	Ca	8−3, 10+2	10·2*b*
7	2817	90	Bh	10−5, 11+1	10·8
8	2818	150	Wf	5−4, 10+1	10·0
9	2819	90	Bh	10−5, =11	10·9
11	2821	47	Gi	q−5, 10+1	10·3
15	2825	90	Bh	=11	10·9
21	2831	,,	,,	11−3, 13+1	11·1
24	2834	62	Wf	=10	10·4
31	2841	60	D	11−2, 15+3	11·2*b*

May 8, Faintly seen.
May 23, Very difficult.
Sept. 7, Oct. 24, Difficult.
June 9, About. Identification doubtful.

April 14, 15, Ms, t.

(5889) U HERCULIS—*continued.*

1921 June					
2	2843	90	Bh	11−5, 13−1	11·4
2	2843	62	Wf	10 (1) v (1) 12	10·7
6	2847	60	D	11−4, 15+3	11·3*b*
7	2848	117	Gi	=11, 12+1, 13+3	11·0
9	2850	62	Wf	=13	11·3
10	2851	90	Bh	13−2, 15+2	11·4
15	2856	,,	,,	13−4, =15	11·6*b*
22	2863	117	Gi	11−4·5, 15+2	11·4
27	2868	90	Bh	11−6, 15+2	11·4
July					
2*	2873	117	Gi	11−2·5, 15+2·5	11·2
3	2874	90	Bh	15+1	11·5
7	2878	62	Wf	15−1, 16+2	11·6
7	2878	120	Br	=15	11·6
8	2879	60	D	15−5	12·1*b*
13	2884	117	Gi	11−4, 15+1	11·4
13	2884	150	Wf	15−1, 18+4	11·7
18	2889	90	Bh	14−1, 15+1	11·5
22	2893	150	Wf	15−3, 18+2	11·9
26	2897	90	Bh	=15	11·6
27	2898	117	Gi	15−3, 17+2	11·9
29	2900	90	Bh	=15	11·6*b*
30	2901	62	Wf	16−3, 17+2	12·0
Aug.					
6	2908	,,	,,	17 (1) v (1) 19	12·1
6	2908	117	Gi	15−4, 17+2	11·9*b*
6	2908	90	Bh	15−1	11·7
14	2916	,,	,,	15−1	11·7
22	2924	117	Gi	15−2·5, 17+1·5	11·9*b*
24	2926	120	D	<15	<11·6
25	2927	90	Bh	15−2	11·8
28	2930	62	Wf	17 (1) v (1) 19	12·1
30	2932	90	Bh	15−3	11·9
Sept.					
2	2935	117	Gi	15−2, 17+3·5	11·7*b*
4	2937	120	D	15−4	12·0*b*
5	2938	90	Bh	15−5	12·1
6	2939	120	Br	=15	11·6
9	2942	150	Wf	15−3, 17+2	11·9
15	2948	117	Gi	11−7, 15+2	11·5*b*
16	2949	90	Bh	15−3	11·9
23	2956	62	Wf	15−2, 17+3	11·8
24	2957	90	Bh	13−2, 15+1	11·5
25	2958	160	Br	15+1	11·5
28	2961	90	Bh	13−1	11·4
29	2962	60	D	<11	<10·9*b*
30	2963	117	Gi	11−7, 15+2	11·5*b*
Oct.					
1	2964	90	Bh	=12, 13+2	11·1
3	2966	62	Wf	13−2, 14+1	11·4
5	2968	90	Bh	=11	10·9
6	2969	48	Wi	13−1, 15+2	11·4
8	2971	90	Bh	10−4, 11+1	10·8
10	2973	117	Gi	10−4, 11+1·5	10·7*b*
15	2978	45	Bh	10−2, 11+3	10·6*b*
20	2983	80	Ca	=14	11·5
21	2984	62	Wf	=13	11·3
23	2986	150	Bh	=10, 11+4	10·4
30	2993	117	Gi	=11	10·9
1921 Nov					
6	3000	45	Bh	10−2, 11+3	10·6
7	3001	160	Br	10−3, 11+3	10·6
8	3002	62	Wf	8−4, 10+1	10·3*b*
18	3012	117	Gi	10−3·5, =11	10·8*b*
25	3019	90	Bh	10−2, 11+2	10·6
28	3022	75	Gi	10−1, 11+2	10·6*c*
Dec.					
3	3027	90	Bh	10−2, 11+3	10·6
4	3028	,,	,,	10−1, 11+4	10·5
13	3037	45	,,	5−2, 10+8	9·5*b*
25	3049	,,	,,	=2	8·2*b*
27	3051	,,	,,	1−6, 2+3	7·9
30	3054	90	,,	1−6, 2+4	7·8
30	3054	75	Gi	1−4, 2+2·5	7·8
1922 Jan					
10	3065	90	Bh	1−4, 2+6	7·6
13	3068	75	Gi	1 (2·5) v (7·5) 2	7·5
18	3073	90	Bh	=1	7·3
20	3075	45	,,	=1	7·3
Feb.					
2	3088	,,	,,	1+1	7·2
5	3091	,,	,,	1+2	7·1*b*
17	3103	,,	,,	1+2	7·1
17	3103	75	Gi	1 (5) v (4) 2	7·8
22	3108	62	Wf	1 (1) v (1) 2, 1−6, 2+4	7·8
26	3112	90	Bh	1−2	7·5
26	3112	32	Ca	k−2, 2+1	8·0
28	3114	62	Wf	1−8, 2+2	8·0
Mar.					
3	3117	75	Gi	1 (9) v (2·5) 2	8·0
4	3118	45	Bh	1−3, 2+7	7·5
5	3119	62	Wf	=2	8·2
19	3133	32	Ca	=n, 4+3	8·6
19	3133	62	Wf	=3	8·4
19	3133	90	Bh	1−9, =2, 4+5	8·3
22	3136	,,	,,	2−4, 5+7	8·6
26	3140	62	Wf	=3	8·4*b*
28	3142	90	Bh	5+2	9·1
Apr.					
4	3149	45	,,	5+1	9·2
4	3149	62	Wf	2−6, 4+2	8·8*b*
14	3159	47	Gi	=4	9·0
17	3162	32	Ca	5−1, 9+1	9·4
17	3162	90	Bh	5−1	9·4
19	3164	62	Wf	4 (1) v (1) 5	9·1
19	3164	33	Wi	5−1	9·4
20	3165	,,	,,	5−3, =7	9·6
23	3168	90	Bh	5+1	9·2
24	3169	33	Wi	5−4	9·7
29	3174	62	Wf	4−2, 5+1	9·2
29	3174	90	Bh	5+1	9·2
May					
2	3177	,,	,,	5+1	9·2
4	3179	120	Wi	=5	9·3
5	3180	90	Bh	5−1	9·4
6	3181	71	Wi	5−1	9·4

June 6, Difficult.
July 8, Doubtful. Very difficult.
July 13, 30, Aug. 6, 28, Wf. 9-in.
Sept. 23, Oct. 21, 6-in.
Oct. 1, Red.
Oct. 3, 9-in.

Jan. 13, 4c.
Feb. 17, Gi, 6c.
Mar. 3, 6c.
Mar. 5, Very red.
Mar. 19, 26, April 4, 19, Wf, Red.
April 14, 5c.
April 19, Wi. Seemed orange.
May 4, Orange.

(5889) U HERCULIS—*continued.*

1922 May					
8	3183	120	Wi	=5	9·3
8	3183	117	Gi	5 (2·5) v (7·5) 10	9·6
8	3183	32	Ca	6−1, 7+1	9·6*b*
12	3187	120	Wi	5−1, 10+8	9·5
13	3188	62	Wf	=5	9·3
14	3189	44	Wi	5−2	9·5
17	3192	90	Bh	5−2, 10+8	9·5
17	3192	44	Wi	5−4, 12+6	10·1
19	3194	120	,,	5−4	9·7
20	3195	31	D	q−3, 10+3	10·1
20	3195	32	Ca	8−2, 10+2	10·1*b*
21	3196	62	Wf	5−2, 10+6	9·6
21	3196	44	Wi	5−2	9·5
21	3196	90	Bh	5−5, 10+5	9·8
22	3197	47	Gi	q+0·5	9·7
27	3202	45	Bh	10+3, 11+6	10·2
27	3202	160	Br	10+2	10·2
28	3203	120	Wi	5−3, 10+1	9·9
28	3203	31	D	q−1, 10+5	9·9
29	3204	62	Wf	5−4, 6−2, =8	9·8*b*
31	3206	32	Ca	8−4, 10+1	10·3*b*
June					
4	3210	45	Bh	=10, 11+5	10·4
5	3211	117	Gi	q (2) v (3·5) 10	10·0
11	3217	62	Wf	7−5, 11+3	10·4*b*
19	3225	45	Bh	=11, 15+10	10·7
24	3230	62	Wf	=11, 13+4	10·9
28	3234	117	Gi	10−0·5	10·4
29	3235	45	Bh	11−2, 12+2, 15+6	11·0
July					
2	3238	62	Wf	10−2, 11+1, 12+3	10·7*b*
11	3247	117	Gi	10 (3) v (2) 11	10·7
14	3250	90	Bh	=12	11·1
20	3256	,,	,,	12−2, 15+2	11·4
23	3259	150	Wf	=14, 15+1	11·5
25	3261	117	Gi	11 (2) v (4) 15	11·1
27	3263	90	Bh	15+1	11·5
30	3266	160	Br	11−4, 15+4	11·2
30	3266	150	Wf	14−2, =15	11·6
Aug					
5	3272	90	Bh	=12, =15	11·4*b*
16	3283	80	Ca	<15	<11·6
17	3284	62	Wf	=17, 18+1	12·0
17	3284	117	Gi	15 (2) v (3) 17	11·8*b*
17	3284	90	Bh	11−8, =15	11·6
20	3287	,,	,,	15−2	11·8
23	3290	,,	,,	15−2	11·8
23	3290	150	Wf	14−6, 18+1	12·0
25	3292	160	Br	15−1·5, 17+3	11·7*b*
25	3292	90	Bh	15−2	11·8
31	3298	,,	,,	15−4	12·0
Sept					
4	3302	,,	,,	15−5	12·1
10	3308	157	Wf	28+0·5	13·1
10	3308	90	Bh	<17	<12·0
15	3313	,,	,,	15−8, 23+3	12·4
16	3314	157	Wf	=28	13·2
17	3315	117	Gi	=24	12·9*b*
21	3319	90	Bh	15−10, 23+1	12·6
23	3321	157	Wf	28+1	13·1
30	3328	90	Bh	28+1	13·1

May 8, Gi, 6c.
May 21, Wi, Difficult owing to colour.
May 22, June 28, July 25, 6c.
July 11, 7c.
Aug. 16, Invisible.

1922 Oct					
4	3332	150	Bh	=28	13·2
8	3336	157	Wf	=28	13·2*c*
12	3340	150	Bh	=28	13·2
15	3343	,,	Wf	23−1, 28+3	12·8
20	3348	90	Bh	<21	<12·6
25	3353	,,	,,	28+1	13·1
Nov					
1	3360	117	Gi	=17	12·0*c*
1	3360	90	Bh	15−5	12·1
9	3368	45	,,	15−3	11·9
11	3370	150	Wf	15−5, =18	12·1
17	3376	117	Gi	15 (2·5) v (2) 17	11·8*b*
18	3377	90	Bh	15−3	11·9
25	3384	,,	,,	15−5	12·1*b*
Dec					
6	3395	,,	,,	15−5	12·1
11	3400	,,	,,	15−5	12·1
16	3405	,,	,,	15−6, 17−1	12·2
25	3414	,,	,,	15−5, =17	12·1
1923					
Jan					
4	3424	45	,,	15−1, 17+3	11·7*b*
11	3431	90	,,	=15	11·6
19	3439	,,	,,	=11, =12	11·0
26	3446	32	Ca	8 (3) v (1) 10	10·2
Feb					
4	3455	90	Bh	5+1	9·2
7	3458	62	Wf	4−2, 5+2	9·1*b*
8	3459	90	Bh	5+3	9·0
23	3474	,,	,,	5+5	8·8
Mar					
2	3481	,,	,,	2−3, 5+7	8·5
5	3484	,,	,,	=2	8·2
9	3488	32	Ca	h−0·5, =k	7·8
13	3492	90	Bh	2+1	8·1
17	3496	45	,,	1−6, 2+2	7·9
19	3498	31	D	k−3, 2+1	8·1
21	3500	45	Bh	2+1	8·1
24	3503	47	Gi	1 (9) v (3·5) 2	7·9
25	3504	45	Bh	1−6, 2+4	7·8
Apr					
6	3516	62	Wf	=2	8·2
7	3517	32	Ca	3 (3) v (3) 4	8·7
8	3518	45	Bh	2+1	8·1
13	3523	90	,,	2+2	8·0
14	3524	,,	,,	2+1	8·1
15	3525	62	Wf	=4, 5+4	8·9
17	3527	90	Bh	5+5	8·8
20	3530	32	Ca	4 (1) v (2) 5	9·1
22	3532	45	Bh	5+2	9·1
27	3537	30	D	4−2, 5+1	9·2
29	3539	75	Gi	4 (3) v (3) 5	9·1
May					
1	3541	90	Bh	=5	9·3
3	3543	,,	,,	5+1	9·2
4	3544	44	Wi	=5	9·3
7	3547	62	Wf	5+1	9·2
8	3548	90	Bh	5−1, 10+8	9·5
9	3549	32	Ca	5 (1) v (1) 6	9·4
10	3550	60	D	5−1, q+4	9·4
11	3551	117	Gi	5+1·5	9·1
12	3552	44	Wi	5+1	9·2
14	3554	60	D	5−2, q+4	9·4
15	3555	40	Wb	5 (1) v (4) 10	9·5

Oct. 8, Difficult.
Mar. 24, April 29, May 11, 6c.

(5889) U HERCULIS—*continued.*

1923 May						1923 Sept					
17	3557	90	Bh	5−1	9·4	29	3692	120	Bn	13−4, 15+1	11·6
20	3560	62	Wf	=5	9·3	30	3693	150	Wf	15−2, 17+2	11·8
21	3561	90	Bh	5−3, 10+7	9·6	30	3693	60	D	15−3, 17+2	11·9*b*
21	3561	50	Bn	5 (1) v (1) 7	9·5	30	3693	90	Bh	15−2	11·8
25	3565	60	D	5−4, q+1	9·7	Oct					
30	3570	90	Bh	5−4	9·7	2	3695	,,	,,	15−2	11·8
June						4	3697	120	Bn	15 (3) v (1) 17	11·9
2	3573	,,	,,	5−5	9·8	5	3698	45	Bh	15−2, 16+2, 17+2	11·7*b*
2	3573	,,	Wh	5 (1) v (2) 13	9·9	7	3700	120	Bn	15 (3) v (1) 17	11·9
3	3574	62	Wf	5−3, 10+7	9·6	8	3701	150	Wf	15−5, =18	12·1
4	3575	60	D	5−4, q+2	9·6	11	3704	90	Bh	15−3, 17+2	11·9
7	3578	40	Wb	5 (3) v (2) 10	9·9	14	3707	120	Bn	15−3	11·9
8	3579	117	Gi	5 (3) v (9) 10	9·6*b*	19	3712	90	Bh	16−3, =17	12·1
10	3581	60	D	q−2, 10+4	10·0	28	3721	150	Wf	15−4, 18+1	12·0
11	3582	30	,,	q−1, 10+4	9·9	Nov					
11	3582	40	Wb	5 (3) v (2) 10	9·9	1	3725	90	Bh	15−7, 17−1	12·2
11	3582	90	Bh	5−6, 10+4	9·9	5	3729	32	Ca	<15	<11·6
12	3583	32	Ca	8 (2) v (3) 10	10·1	7	3731	90	Bh	15−7, 17−1	12·2*b*
18	3589	30	D	q−2, 10+2	10·1	8	3732	,,	,,	15−6, 23+4	12·3
23	3594	90	Wh	5 (1) v (2) 13	9·9	10	3734	,,	,,	15−6, 23+4	12·3
23	3594	,,	Bh	5−10, 11+7	10·2*b*	16	3740	,,	,,	15−4	12·0
July						30	3754	,,	,,	15−1	11·7*b*
1	3602	62	Wf	5−7, 10+2	10·1	Dec					
5	3606	90	Bh	10−2, 11+3	10·6*b*	4	3758	,,	,,	=15	11·6*b*
6	3607	60	D	q−5, 10+1	10·3	8	3762	,,	,,	=15	11·6
6	3607	117	Gi	5 (11) v (2) 10	10·2	12	3766	,,	,,	15+1	11·5
7	3608	90	Wh	=11	10·9	17	3771	,,	,,	13−1, 15+2	11·4
8	3609	60	D	=10	10·4	20	3774	32	Ca	>17	>12·0
10	3611	62	Wf	9−2, 11+2	10·7	22	3776	90	Bh	12−1, 14+2	11·2*b*
13	3614	60	D	10−3, 11+2	10·7	1924					
14	3615	90	Bh	10−1, 11+1	10·6	Jan					
15	3616	62	Wf	10−3, 11+2	10·7	5	3790	,,	,,	11−3, =12, 13−1	11·2
16	3617	60	D	10−5, 11+2	10·8	6	3791	120	Bn	11 (1) v (1) 12	11·0
17	3618	32	Ca	10 (3) v (2) 11	10·7	11	3796	90	Bh	=11	10·9
20	3621	60	D	11−1, 15+5	11·0	16	3801	,,	,,	=10, =11	10·6
21	3622	90	Bh	=11	10·9	16	3801	32	Ca	=10	10·4
22	3623	62	Wf	10−2, 11+2	10·6	23	3808	90	Bh	10−1, 11+3	10·5*b*
31	3632	90	Bh	=12, 13+2	11·1*b*	26	3811	,,	,,	10+1, 11+5	10·3*b*
Aug						31	3816	45	,,	5−6, 10+5	9·9
3	3635	,,	,,	11−1, 12+1	11·0	Feb					
6	3638	150	Wf	11−1, 15+5	11·0	1	3817	30	D	q−2, 10+4	10·0
8	3640	32	Ca	12 (1) v (1) 13	11·2	8	3824	,,	,,	q−1, 10+4	9·9
11	3643	90	Bh	13−1, 15+3	11·3	8	3824	62	Wf	10+3, 11+7	10·1
11	3643	120	Bn	11 (2) v (1) 12	11·0	11	3827	90	Bh	5−4	9·7
11	3643	60	D	11−4, 15+2	11·3	14	3830	,,	,,	5−1	9·4*b*
12	3644	150	Wf	11−5, 15+4	11·3	14	3830	30	D	5−4, 9+1	9·7
15	3647	50	Bn	=12	11·1	15	3831	32	Ca	q (4) v (3) 9	10·2
15	3647	90	Bh	12−1, 14+2	11·2	16	3832	50	Bn	5 (1) v (3) 8	9·4
18	3650	,,	,,	13−1, 15+2	11·4	22	3838	45	Bh	5+1	9·2
22	3654	120	D	11−4, 15+1	11·4	27	3843	,,	,,	5+3	9·0
26	3658	90	Bh	=15	11·6	29	3845	32	Ca	=5	9·3
30	3662	,,	,,	15+1	11·5*b*	Mar					
30	3662	150	Wf	12−2, 15+2	11·4	2	3847	90	Bh	5+5	8·8
Sept						4	3849	,,	,,	5+3	9·0
1	3664	120	D	11−5, 15+1	11·4	4	3849	50	Bn	3 (4) v (1) 4	8·8
5	3668	,,	Bn	13 (2) v (1) 15	11·5	7	3852	90	Bh	5+4	8·9
7	3670	62	Wf	12−4·5, =15	11·6	8	3853	60	D	n−2·5, 4+2	8·8
7	3670	90	Bh	15+1	11·5	9	3854	32	Ca	=2	8·2
8	3671	160	Br	11−2, 13+2	11·1	9	3854	50	Bn	3 (5) v (2) 4	8·8
11	3674	120	Bn	13 (3) v (1) 15	11·5	9	3854	90	Bh	2−3, 5+7	8·5
13	3676	150	Wf	=15	11·6	10	3855	,,	,,	2−1, 5+10	8·3
13	3676	90	Bh	15−1, 17+3	11·7*b*	11	3856	30	D	n−1, 4+2	8·7
16	3679	,,	,,	=15	11·6						
16	3679	120	Bn	13 (3) v (1) 15	11·5						
22	3685	90	Bh	15−1	11·7*b*						

Aug. 22, 5-in. OG.

Sept. 30, D, Difficult.
Nov. 5, Invisible.
Dec. 20, Glimpsed.

(5889) U HERCULIS—*continued.*

1924					
Mar					
12	3857	...	Wb	=2	8·2
14	3859	90	Bh	=2	8·2
19	3864	45	,,	2+1	8·1*b*
22	3867	,,	,,	2+1	8·1*b*
26	3871	,,	,,	1 (2) v (1) 2	7·9
26	3871	32	Ca	=k	7·8
29	3874	45	Bh	=1	7·3
30	3875	30	D	g−3, k+1	7·7
31	3876	10	Wi	1−4, 2+5	7·7
Apr					
1	3877	,,	,,	1−6, 2+3	7·9
1	3877	20	Wb	1 (2) v (3) 2	7·7
1	3877	50	Bn	1−1	7·4
2	3878	32	Ca	g (1) v (2) h	7·5
2	3878	45	Bh	1+1	7·2
3	3879	,,	,,	=1	7·3
3	3879	32	Ca	=g	7·4
4	3880	30	D	g−2, k+2	7·6
4	3880	50	Bn	=1	7·3
6	3882	45	Bh	1+1	7·2
7	3883	50	Bn	1−1·5	7·5
7	3883	20	Wb	=1	7·3
7	3883	10	Wi	f−3, 2+6	7·5
8	3884	,,	,,	=f	7·2
9	3885	,,	,,	f+0·5	7·1
9	3885	32	Ca	=1	7·3
11	3887	30	D	g−1, k+4	7·5
11	3887	45	Bh	1,+1	7·2
14	3890	32	Ca	=f	7·2
14	3890	45	Bh	1+1, 2+10	7·2
20	3896	,,	,,	1+1	7·2
20	3896	50	Bn	1+2	7·1
23	3899	32	Ca	e (1) v (1) f	7·1
24	3900	F	Wf	=f, =1	7·2
25	3901	45	Bh	1+1	7·2
27	3903	20	Wb	=1	7·3
27	3903	10	Wi	=f	7·2
30	3906	45	Bh	1+1	7·2
May					
1	3907	10	Wi	e−1, f+1	7·1
4	3910	30	D	=f	7·2
4	3910	32	Ca	=1	7·3
5	3911	45	Bh	1+1	7·2
5	3911	10	Wi	e−2, f+1	7·1
5	3911	50	Bn	1+2	7·1
7	3913	F	Wf	=f	7·2
7	3913	30	D	f−1, g+1	7·3
9	3915	,,	,,	f−1, g+2	7·2
9	3915	32	Ca	=1	7·3
12	3918	F	Wf	f−2, 2+7	7·4
13	3919	45	Bh	1+1	7·2
13	3919	30	D	f−2, g+1	7·3
14	3920	32	Ca	=1	7·3
16	3922	45	Bh	1+1	7·2
21	3927	30	D	f (3) v (2) g	7·3
22	3928	20	Wb	1 (1) v (4) 2	7·5
22	3928	45	Bh	1+1	7·2
23	3929	30	D	f−2, g+2	7·3
25	3931	F	Wf	1−6, 2+4	7·8
26	3932	45	Bh	1−1	7·4
26	3932	32	Ca	g (1) v (2) h	7·5
26	3932	30	D	=g	7·4
26	3932	40	Wb	1 (2) v (3) 2	7·7
1924					
May					
27	3933	20	Wb	1 (1) v (4) 2	7·5
28	3934	45	Bh	1−4	7·7
29	3935	32	Ca	=k	7·8
30	3936	30	D	=k	7·8
31	3937	45	Bh	1−5	7·8
June					
2	3939	62	Wf	=2	8·2
4	3941	45	Bh	1−7, 2+1	8·0
5	3942	30	D	k−3, 2+2	8·0
5	3942	20	Wb	1 (4) v (1) 2	8·0
8	3945	32	Ca	k (2) v (2) 2	8·0
9	3946	30	D	k−4, 2+1	8·1
13	3950	45	Bh	2−1	8·3
17	3954	30	D	2−1	8·3
18	3955	45	Bh	2−2	8·4
19	3956	20	Wb	1 (4) v (1) 2	8·0
22	3959	60	D	3−2, 4+4	8·6
23	3960	62	Wf	2−5, 5+7	8·6
23	3960	20	Wb	2 (2) v (3) 3	8·2
24	3961	45	Bh	2−3, 5+8	8·5
25	3962	20	Wb	2 (3) v (2) 4	8·6
26	3963	30	D	3−2, 4+5	8·5
26	3963	62	Wf	2−3, 4+5	8·5
30	3967	,,	,,	4+1, 5+5·5	8·8
30	3967	20	Wb	3 (3) v (2) 4	8·7
30	3967	45	Bh	2 (1) v (2) 5	8·6
July					
4	3971	,,	,,	2 (1) v (1) 5	8·7
4	3971	20	Wb	=4	9·0
6	3973	,,	,,	=4	9·0
6	3973	30	D	3−5, 4+2	8·8
6	3973	32	Ca	=4	9·0
7	3974	62	Wf	4+1, 5+4	8·9
9	3976	30	D	4−1, 5+3	9·0
9	3976	45	Bh	4+2, 5+5	8·8
10	3977	62	Wf	4−1, 5+3	9·0
10	3977	20	Wb	3 (3) v (2) 4	8·7
12	3979	90	Bh	5+5	8·8
13	3980	50	Bn	4 (1) v (2) 5	9·1
13	3980	60	D	4−2, 5+2	9·1
14	3981	45	Bh	=4	9·0
19	3986	,,	,,	2 (2) v (1) 4	8·7*b*
21	3988	50	Bn	3 (4) v (1) 4	8·8
21	3988	20	Wb	=5	9·3
22	3989	62	Wf	5+1	9·2
24	3991	20	Wb	=5	9·3
24	3991	90	Bh	5+1	9·2
25	3992	32	Ca	=5	9·3
27	3994	62	Wf	5−0·5	9·3
29	3996	50	Bn	4 (1) v (2) 5	9·1
29	3996	90	Bh	5−1	9·4
31	3998	60	D	5−3, q+3	9·5
Aug					
2	4000	50	Bn	4 (1) v (1) 5	9·1
5	4003	45	Bh	=5	9·3
5	4003	50	Wb	=5	9·3
6	4004	32	Ca	5 (3) v (3) 8	9·6
6	4004	62	Wf	5−1, 6+1	9·4
7	4005	50	Bn	4 (1) v (2) 5	9·1
7	4005	37	Wb	=5	9·3
8	4006	90	Bh	5−1	9·4
9	4007	30	D	5−3, q+3	9·5
15	4013	90	Bh	5−3	9·6

Mar. 12, 2-in. OG.
April 11, D, 5^{c}. Bh, Orange.
May 26, D, 7^{c}.

June 5, D, 4^{c}.
July 21, Wb, 4-in. OG. from here onwards.
July 24, 29, Bh, Copper coloured.

(5889) U HERCULIS—*continued.*

1924					
Aug					
15	4013	60	D	5−4, q+1	9·7
17	4015	,,	,,	5−3, q+2	9·6
18	4016	50	Wb	5 (2) v (3) 8	9·5
19	4017	90	Bh	5−2	9·5
22	4020	60	D	5−4, q+2	9·6
22	4020	62	Wf	5−3, 10+7	9·6
24	4022	,,	,,	5−5·5, 10+5	9·9
27	4025	45	Bh	5−5	9·8*b*
31	4029	37	Wb	=8	9·9
Sept					
2	4031	62	Wf	10+3, 11+7	10·1
2	4031	90	Bh	5 (1) v (1) 10	9·8
9	4038	50	Bn	8 (3) v (1) 10	10·2
9	4038	90	Bh	5 (2) v (1) 10	10·0*b*
10	4039	62	Wf	10+2, 11+7	10·2
10	4039	40	D	q−1, 10+4	9·9
16	4045	90	Bh	=11, 12+2	10·9
18	4047	32	Ca	10 (1) v (4) 11	10·5
23	4052	90	Bh	=12, 13+2	11·1
26	4055	,,	,,	=12, =13	11·2*b*
26	4055	62	Wf	10−2, 11+3	10·6
27	4056	50	Bn	8 (5) v (1) 10	10·3
27	4056	,,	Wb	=13	11·3
Oct					
1	4060	90	Bh	13−3, =15	11·6
5	4064	62	Wf	11−0·5, 12+2	10·9
6	4065	90	Bh	13 (1) v (1) 15	11·4*b*
8	4067	,,	,,	12 (1) v (1) 15	11·4*b*
11	4070	,,	,,	13−3, =14, 15+1	11·5
1924					
Oct					
15	4074	90	Bh	13 (2) v (1) 15	11·5
16	4075	62	Wf	10 (1) v (1) 15	11·2
20	4079	32	Ca	13 (3) v (4) 17, =15	11·6
22	4081	120	Bn	13 (1) v (4) 15	11·3
23	4082	40	D	11−6, 15+2	11·4
23	4082	94	Li	=15	11·6
24	4083	90	Bh	11 (2) v (1) 15	11·4
31	4090	,,	,,	15−1	11·7
Nov					
3	4093	,,	,,	13 (2) v (1) 15	11·5*b*
4	4094	120	Bn	13 (3) v (1) 15	11·5
8	4098	45	Bh	15−2	11·8*b*
14	4104	80	Ca	<13	<11·3
15	4105	90	Bh	13−5	11·8*b*
17	4107	120	Bn	15−2	11·8*b*
17	4107	94	Li	15 (5) v (5) 17	11·8*c*
28	4118	90	Bh	15−5	12·1*b*
30	4120	120	Bn	15−3	11·9*b*
Dec					
4	4124	90	Bh	15 (1) v (2) 23	12·0*b*
13	4133	,,	,,	15 (2) v (1) 23	12·4*b*
19	4139	,,	,,	=23	12·7
24	4144	,,	,,	13 (3) v (1) 28, =23	12·7
28	4148	120	Bn	17−3	12·3
28	4148	90	Bh	23+2	12·5
31	4151	,,	,,	23+3	12·4

Nov. 14, Invisible.

(4826) R HYDRÆ. (V. 1.)

H.D. *132422.*

Star C	= Fl. 63 Virginis,	5m.45,	**H.A., 50,** 118.
,, D	= Fl. 54 ,,	6·27,	,, **50,** 117.
,, E	= α Corvi,	4·18,	,, **50,** 110.
,, F	= η ,,	4·42,	,, **50,** 113.
,, G	= C.D. — 23° 11025,	7·12,	,, **54,** 146.
,, H	= B.D. — 22° 3564,	7·13,	,, **54,** 146.
,, K	= C.D. — 23° 11021,	7·25,	,, **54,** 146.
,, L	= B.D. — 18° 3587,	6·18,	,, **50,** 118.
,, M	= ,, — 20° 3818,	6·52,	,, **45,** 170.
,, O	= Fl. 75 Virginis,	5·65,	,, **50,** 119.
,, P	= B.D. — 17° 3877 = Fl. 73 Virginis,	5·88,	,, **45,** 171.
,, Q	= C.D. — 25° 9900,	5·49,	,, **50,** 120.
,, R	= κ Virginis,	4·31,	,, **50,** 124.
,, S	= λ ,,	4·60,	,, **50,** 125.
,, T	= i Centauri,	4·39,	,, **45,** 173.
,, U	= d ,,	3·96,	,, **50,** 119.
,, W	= B.D.— 17° 3937 = Fl. 89 Virginis,	5·13,	,, **45,** 174.
,, X	= ζ Corvi,	5·30,	,, **50,** 111.
,, β	= C.D. — 25° 9653,	6·48,	,, **50,** 117.
	τ Virginis,	4·34,	,, **50,** 123.
	χ ,,	4·78,	,, **50,** 114.
	Fl. 74 ,,	4·83,	,, **50,** 119.
	Fl. 53 ,,	5·09,	,, **50,** 117.
	Fl. 55 ,,	5·63,	,, **50,** 117.
	Fl. 87 ,,	5·79,	,, **50,** 121.
	Fl. 85 ,,	6·15,	,, **50,** 121.

Date.	Julian Date.	Inst.	Observer.	Comparisons.	Deduced Mag.
1920 Jan					
1	2325	30	Bn	1 (2) v (1) 3	6·8
8	2332	,,	,,	1 (2) v (1) 3	6·8
17	2341	,,	Sk	=5	7·7
19	2343	,,	Bn	3 (4) v (1) 6	7·7
23	2347	65	Gl	1—4, 2+4	6·7*b*
26	2350	30	Bn	3 (4) v (1) 6	7·7
27	2351	,,	Sk	6 (1) v (1) 7	7·9
30	2354	65	Gl	=3	7·0
31	2355	30	Bn	6 (1) v (1) 7	7·9
Feb					
5	2360	65	Gl	3—6, 6+2	7·6
11	2366	30	Sk	7 (1) v (1) 8	8·2
12	2367	65	Gl	6—5, 14+6	8·3
16	2371	25	Wd	7 (5) v (5) 8	8·2
23	2378	30	Sk	8 (1) v (3) 11	8·4
24	2379	65	Gl	6—8, 14+3	8·6
Mar					
8	2392	30	Sk	11 (2) v (1) 14	8·8
11	2395	65	Gl	6—10, 14+1	8·8
17	2401	30	Sk	14+1	8·9
18	2402	,,	Bn	14 (1) v (2) 19	9·1*b*

Jan. 23, Poor observation.

Date.	Julian Date.	Inst.	Observer.	Comparisons.	Deduced Mag.
1920 Mar					
18	2402	65	Gl	6—9, 14+2	8·7
26	2410	,,	,,	6—10, 14+1	8·8
27	2411	30	Sk	=14	9·0
Apr					
6	2421	,,	,,	=17	9·3
14	2429	,,	,,	17 (1) v (2) 19	9·3
15	2430	25	Wd	17 (5) v (5) 19	9·4
21	2436	75	Bn	19 (1) v (2) 22	9·6
25	2440	30	Sk	19+1	9·4
May					
7	2452	,,	,,	17—1	9·4
7	2452	25	Wd	19—1	9·6
7	2452	75	Bn	14 (4) v (1) 19	9·4
11	2456	65	Gl	=14	9·0
13	2458	75	Bn	14 (3) v (1) 19	9·4
16	2461	30	Sk	14 (2) v (1) 17	9·2
21	2466	75	Bn	14 (1) v (2) 19	9·1
21	2466	65	Gl	6—10, 14+1	8·8*b*
26	2471	25	Wd	=17	9·3
27	2472	65	Gl	6—9, 14+2	8·7*b*

May 27, Red.

(4826) R HYDRÆ—*continued.*

1920 June					
11	2487	65	Gl	6−6, 14+5	8·4*b*
11	2487	25	Wd	8 (7) v (3) 14	8·8
15	2491	,,	,,	8 (7) v (3) 14	8·8
17	2493	65	Gl	.6−8, 14+3	8·6*b*
25	2501	,,	,,	6+2	7·6
28	2504	25	Wd	5 (7) v (3) 8	8·2
July					
5	2511	,,	,,	=6	7·8
5	2511	30	Sk	5 (2) v (1) 6	7·8
9	2515	65	Gl	q−2, 6+4	7·5*b*
12	2518	25	Wd	1 (5) v (5) 6	7·1
13	2519	30	Sk	5 (1) v (3) 6	7·7
14	2520	65	Gl	q−1, 6+5	7·4
15	2521	25	Wd	1 (5) v (5) 6	7·1
Aug					
3	2540	,,	,,	1 (3) v (7) 6	6·8
4	2541	30	Sk	5+3	7·4
5	2542	65	Gl	q+2·5	7·1
12	2549	30	Sk	5+3	7·4
14	2551	40	Gl	G−1, q+1	7·2
17	2554	25	Wd	1 (5) v (5) 2	6·7
19	2556	65	Gl	q+1·5	7·2
19	2556	30	Sk	5+4	7·3
30	2567	25	Wd	=1	6·3
31	2568	65	Gl	G+5	6·6
Sept					
2	2570	30	Sk	5+4	7·3
4	2572	25	Wd	1+2	6·1*b*
9	2577	B	,,	=m	5·9
19	2587	,,	Sk	2 (1) v (3) 4	7·3
Nov					
8	2637	,,	Bh	=h	5·1
11	2640	,,	,,	=h	5·1
19	2648	,,	Sk	g+3	4·5*b*
Dec					
7	2666	NE	Bh	=h	5·1
11	2670	B	Sk	g (2) v (1) h	5·0
12	2671	45	Bh	=h	5·1*b*
20	2679	B	Sk	k (1) v (1) l	5·4
21	2680	,,	Bh	h−5	5·6
24	2683	,,	Gi	h−2·5, k+1·5, l+4	5·2
31	2690	,,	Bh	h−7, 1+7	5·7
31	2690	,,	Sk	k (2) v (1) m	5·7
1921 Jan					
4	2694	,,	Gi	C−2, D+3	5·8
6	2696	,,	Bh	h−10	6·1
8	2698	,,	Ca	P−4, 1+1	6·3
8	2698	,,	Sk	m (1) v (2) 1	6·0
10	2700	30	Bn	1+3	6·0
10	2700	F	Bh	h−10	6·1
13	2703	30	Bn	1+2	6·1
16	2706	B	Sk	1−1	6·4
18	2708	,,	Bn	h (5) v (1) 1	6·1
19	2709	,,	Gi	=M	6·5*b*
27	2717	,,	Bh	h−9, 1+3	6·0*b*
30	2720	45	,,	h−15, 2+5	6·6
30	2720	B	Sk	2+1	7·0
31	2721	30	Bn	1 (3) v (2) 3	6·8
Feb					
2	2723	45	Bh	=2	7·1
4	2725	B	Gi	=2, 3−1	7·1
8	2729	,,	Sk	2 (1) v (2) 4	7·3
9	2730	32	Ca	1−7, 2+1	7·0
9	2730	45	Bh	=2	7·1
17	2738	30	Sk	5+2	7·5
17	2738	65	Gl	H−3·5, 6+3·5	7·5
17	2738	30	Bn	3 (4) v (1) 6	7·8
18	2739	B	Bh	2−2, 4+2	7·4
19	2740	47	Gi	4−1·5, 5−1, 7+6	7·7*b*
25	2746	30	Sk	5+3	7·4*b*
28	2749	32	Ca	2−2, 3+1	7·1
Mar					
2	2751	45	Bh	=3, =4	7·3*b*
2	2751	30	Bn	6 (3) v (2) 7	8·0
3	2752	65	Gl	H−3, 6+4	7·4
4	2753	47	Gi	5−2·5, 7+4	7·8
6	2755	45	Bh	=4, 5+1, 6+4	7·6
7	2756	30	Sk	=7	8·0
9	2758	65	Gl	H−2, 6+5	7·3
11	2760	45	Bh	=4, =5, 6+2	7·7
12	2761	32	Ca	7−1, 8+3	8·1
16	2765	45	Bh	=5, =6	7·8*b*
17	2766	65	Gl	H−5, 6+2	7·5
17	2766	30	Sk	8+1	8·3
18	2767	,,	Bn	6−4, 7−1	8·2*b*
24	2773	65	Gl	H−7	7·8*b*
24	2773	45	Bh	5−2, 6+1, 9+6	7·8*b*
27	2776	30	Sk	11+1	8·4
29	2778	45	Bh	5−5	8·2*b*
Apr					
1	2781	,,	,,	10 (1) v (1) 12	8·8
1	2781	65	Gl	6−9, 14+2·5	8·7*b*
3	2783	30	Bn	8 (7) v (2) 14	8·8
3	2783	47	Gi	=8, 10+2	8·5*b*
3	2783	30	Sk	11+1	8·4
4	2784	45	Bh	6 (3) v (1) 12	8·6
5	2785	32	Ca	14−2, 17+1	9·2
6	2786	30	Bn	8 (2) v (1) 14	8·8
7	2787	45	Bh	=14	9·0
12	2792	30	Sk	11−1	8·6
14	2794	,,	Bn	8 (3) v (1) 14	8·8
15	2795	65	Gl	6−10, 14+1	8·8
21	2801	,,	,,	14−1, 19+5	9·0*b*
22	2802	47	Gi	11−5, 13−1·5, 14+2	9·0*b*
26	2806	65	Gl	14−2, 19+4	9·1
27	2807	30	Sk	14 (2) v (1) 17	9·2
27	2807	32	Ca	17−2, 19+1	9·4
27	2807	75	Bn	14 (2) v (1) 19	9·3
27	2807	45	Bh	11−3, 17+3	8·9*b*
30	2810	,,	,,	=17	9·3
May					
1	2811	75	Bn	14 (3) v (1) 19	9·4
5	2815	65	Gl	14−1	9·1
7	2817	45	Bh	=17	9·3*b*
8	2818	75	Bn	19+0·5	9·5
9	2819	45	Bh	=17	9·3
9	2819	47	Gi	14−2·5, 17+2·5	9·1
9	2819	30	Sk	19−1	9·6
10	2820	65	Gl	14−3, 19+3	9·2
10	2820	32	Ca	19−1, 22+3	9·6
18	2828	65	Gl	14−4, 19+2	9·3*b*
23	2833	30	Sk	19 (3) v (1) 22	9·8
23	2833	45	Bh	17−3, =19	9·5
23	2833	50	Bn	19 (2) v (1) 22	9·8

June 17, Very poor.
Aug. 14, 8-in. OG.
Aug. 19, Gl, Sept. 9, Difficult.
Jan. 10, Bn, Yellowish orange. With B, 6·0.
Jan. 13, Yellowish orange. With B, 6·1.

Feb. 19, Aperture reduced to 5-in.
Mar. 4, Aperture reduced to 6-in.

(4826) R HYDRÆ—*continued.*

1921 May 25	2835	32	Ca	=22	9·9
27	2837	,,	,,	=22	9·9
31	2841	47	Gi	=19	9·5*b*
June 3	2844	30	Sk	=23	10·1
14	2855	,,	,,	19 (1) v (2) 22	9·6
16	2857	117	Gi	14−6, 18+2·5	9·5
23	2864	65	Gl	14−3, 19+3	9·2*b*
25	2866	30	Sk	17 (1) v (1) 23	9·7
28	2869	75	Gi	14−1, 17+2	9·1
29	2870	32	Ca	19−3, 22+1	9·8
30	2871	65	Gl	14−4, 19+2	9·3
July 7	2878	,,	,,	6−10, 14+1	8·8
9	2880	30	Sk	17 (1) v (2) 19	9·3
13	2884	75	Gi	7−5, 11+1, 14+2·5	8·5
15	2886	65	Gl	6−9, 14+2·5	8·7*b*
22	2893	30	Sk	14+3	8·7
Aug 1	2903	,,	,,	6−1	7·9
3	2905	32	Ca	7−3, 11+2	8·3
4	2906	65	Gl	6−8, 14+3·5	8·6
11	2913	30	Sk	6+1·5	7·7
22	2924	,,	,,	5 (1) v (2) 6	7·7
30	2932	,,	,,	=5	7·7
31	2933	65	Gl	6−2	8·0*b*
Sept 7	2940	,,	,,	6+3	7·5
15	2948	40	,,	G−1, K+1	7·2*b*
18	2951	30	Sk	5+1	7·6
Nov 12	3006	B	Bh	=h	5·1*b*
24	3018	,,	,,	a (2) v (1) h	4·5
29	3023	,,	Gi	=A, =g, h+2·5	4·8*b*
Dec 5	3029	NE	Ca	F−1, g+3	4·5
15	3039	B	Bh	a (1) v (1) h	4·2
17	3041	NE	Ca	=E, =e	4·2
23	3047	B	Bn	f (1) v (1) g	4·6
25	3049	,,	Bh	a (1) v (1) h	4·2
27	3051	,,	,,	a (1) v (1) h	4·2
27	3051	,,	Gi	a−18, h+6	4·8
31	3055	,,	Bh	a (3) v (2) h	4·4
1922 Jan 3	3058	,,	Bn	f (3) v (2) g	4·6
7	3062	NE	Ca	E−1	4·3
7	3062	B	Gi	a (14) v (4·5) h	4·6
10	3065	,,	Bh	a (4) v (1) h	4·7*b*
12	3067	,,	Gl	=Q	5·5
18	3073	,,	Bh	a (2) v (1) h	4·5*b*
21	3076	,,	,,	h+2	4·9*b*
23	3078	NE	Ca	g−1, h+2	4·9
27	3082	65	Gl	=m	5·9*b*
Feb 1	3087	NE	Ca	h−1, X+1	5·2
2	3088	B	Bh	=h	5·1*b*
4	3090	,,	Gi	k (2) v (1) l	5·5*b*
7	3093	NE	Ca	h−4, O+1	5·5
10	3096	65	Gl	m−2	6·1*b*
17	3103	45	Bh	h−5	5·6
18	3104	B	Gl	m−1	6·0*b*
22	3108	,,	Ca	m−1, 85Virg+1	6·0

Sept. 7, Red.
Sept. 15, 8-in. OG.
Jan. 27, About.

1922 Feb 23	3109	B	Gi	1 (3) v (1) m	5·8
25	3111	,,	Gl	1+1	6·2
26	3112	,,	Bh	h−7, 1+7	5·7*b*
Mar 5	3119	,,	Gl	=1	6·3
15	3129	45	Bh	h−10, 1+2	6·1
17	3131	B	Ca	2−1	7·2
19	3133	45	Bh	h−16, 2+4	6·7
28	3142	,,	,,	2+3, 4+8	6·8
28	3142	65	Gl	3+1	6·9
29	3143	B	,,	<2	<7·1
30	3144	32	Ca	2−3	7·4
Apr 4	3149	45	Bh	=2	7·1
6	3151	65	Gl	3−4, 6+4	7·4
9	3154	45	Bh	2−1, 4+2	7·3
14	3159	47	Gi	4 (2) v (6·5) 7	7·7
14	3159	32	Ca	=4, =5	7·7
18	3163	45	Bh	5+1, 6+3	7·6
19	3164	30	Bn	6 (1) v (2) 7	7·9
19	3164	33	Wi	=6	7·8
20	3165	,,	,,	6+1	7·7
23	3168	45	Bh	=5	7·7*b*
24	3169	33	Wi	6−1, 14+8	8·0
26	3171	32	Ca	7−2, 8+2	8·2
27	3172	30	Bn	=7	8·0
29	3174	45	Bh	=5, 6+1	7·7*b*
May 4	3179	33	Wi	=6	7·8
5	3180	32	Ca	7−4, =8	8·4
6	3181	45	Bh	=6	7·8
8	3183	47	Gi	5 (8) v (3) 7	7·9
12	3187	45	Bh	5−2, 6−2, 7+2	7·9
12	3187	65	Gl	6−4, 14+8	8·2
14	3189	30	Bn	8 (1) v (2) 14	8·6
17	3192	45	Bh	6−3	8·1
19	3194	30	Bn	8 (1) v (2) 14	8·6
20	3195	32	Ca	11−4, 14+1	8·9*b*
22	3197	47	Gi	9 (1·5) v (4) 14	8·6
24	3199	65	Gl	6−6, 14+5	8·4
27	3202	45	Bh	6−5	8·3
28	3203	31	D	10−4, 14+1	9·0
30	3205	32	Ca	14−2, 17+1	9·2*b*
June 21	3227	117	Gi	14 (2) v (3) 17	9·1
July 1	3237	32	Ca	19−2, 22+2	9·7
8	3244	117	Gi	14 (5) v (3) 17	9·1*c*
10	3246	65	Gl	17−2	9·5
15	3251	32	Ca	19−3, 22+1	9·8*b*
29	3265	65	Gl	14−4·5, 19+1	9·4
Aug 3	3270	,,	,,	=19	9·5*b*
31	3298	,,	,,	6−10, 14+1	8·8
Sept 8	3306	,,	,,	6−12, 19+5	9·0
15	3313	,,	,,	6−9, 19+8	8·7

Feb. 23, May 22, 7^c.
April 14, Gi, 6^c.
April 19, Wi, Deep orange.
April 24, Difficult owing to colour.
May 8, June 21, July 8, 8^c.
May 24, Very red.
Sept. 15, Red.
Bh rates all his estimates made with B as Class 3.

(4826) R HYDRÆ—*continued.*

1922 Oct					
25	3353	45	Bh	=7	8·0*b*
Nov					
14	3373	,,	,,	=5, 6+5	7·5*b*
18	3377	32	Ca	=4, 5+1	7·6
24	3383	45	Bh	=2	7·1
Dec					
6	3395	,,	,,	2+4	6·7
11	3400	,,	,,	2+6, 5+10	6·6*b*
16	3405	,,	,,	2+6, 5+10	6·6
20	3409	30	Bn	1 (2) v (1) 3	6·8
25	3414	45	Bh	2+10	6·1
1923 Jan					
4	3424	,,	,,	h−5, 1+10	5·5
5	3425	B	Ca	=X	5·3
9	3429	,,	Gl	=h	5·1*b*
14	3434	NE	Ca	=h	5·1
14	3434	B	Bh	=h	5·1*c*
17	3437	,,	Gi	A−2, g+1	4·9
18	3438	,,	Bh	h+2	4·9*c*
20	3440	,,	Bn	g (3) v (1) h	5·0
21	3441	,,	Gl	a−12, h+6	4·5
21	3441	NE	Ca	F (4) v (3) h	4·8
25	3445	B	Gl	a−9, h+9	4·2
26	3446	NE	Ca	τVirg (4) v (1) χVirg	4·7
27	3447	,,	,,	τVirg (3) v (2) 74 Virg	4·6
30	3450	B	Bh	a (3) v (2) h	4·4*c*
31	3451	NE	Ca	τVirg (2) v (3) 74 Virg	4·5
Feb					
4	3455	B	Bh	a (3) v (2) h	4·4*c*
4	3455	NE	Ca	τVirg (2) v (3) 74 Virg	4·5
6	3457	B	Bn	=g	4·8*b*
7	3458	,,	Gl	a−11, h+7	4·4
7	3458	NE	Ca	τVirg (2) v (3) 74 Virg	4·5
8	3459	B	Bh	a (3) v (2) h	4·4*c*
10	3461	NE	Ca	τVirg (2) v (3) 74 Virg	4·5
13	3464	,,	,,	τVirg (2) v (3) 74 Virg	4·5
14	3465	,,	,,	=S	4·6
15	3466	,,	Gl	a−14, h+4	4·7
16	3467	B	Bh	a (3) v (1) h	4·6*c*
17	3468	NE	Cn	h+3	4·8
19	3470	,,	Ca	S (1) v (1) g	4·7
23	3474	,,	Cn	h+2	4·9
23	3474	B	Bh	a (4) v (1) h	4·7*c*
25	3476	NE	Ca	=g	4·8
Mar					
2	3481	45	Bh	=h	5·1
7	3486	B	Cn	h−5	5·6
8	3487	45	Bh	=h	5·1
8	3487	NE	Ca	h (1) v (1) k	5·2
9	3488	,,	,,	53 Virg (2) v (2) C	5·3
10	3489	B	Cn	h−5	5·6
11	3490	NE	Ca	53 Virg (2) v (2) C	5·3
13	3492	45	Bh	h−3	5·4
13	3492	NE	Ca	=X	5·3
14	3493	B	Cn	h−9	6·0
16	3495	,,	Ca	=C	5·5
17	3496	45	Bh	h−5	5·6
17	3496	B	Gl	h−9, 1+3	6·0
17	3496	,,	Bn	h−2	5·3
17	3496	NE	Cn	h−9	6·0
18	3497	,,	,,	=k, =55 Virg	5·5
18	3497	,,	Ca	C (1) v (1) 55 Virg	5·5
22	3501	,,	,,	87 Virg−1, =P	5·9
23	3502	B	Cn	k−4, 55 Virg−4	5·9*b*
25	3504	,,	,,	k−5, L+4	5·8*b*
25	3504	,,	Gl	h−8, 1+4	5·9
25	3504	45	Bh	h−8, 1+6	5·8
1923 Mar					
26	3505	NE	Ca	P (2) v (1) D	6·2
29	3508	B	Cn	1+3	6·0
Apr					
1	3511	45	Bh	h−10	6·1
5	3515	B	Gi	D (2) v (3) M	6·4
6	3516	,,	Ca	m (4) v (1) 1	6·2
7	3517	,,	Gl	=1	6·3
8	3518	30	Bn	1+2	6·1
9	3519	45	Bh	2+10	6·1
9	3519	B	Gl	1−4, 2+4	6·7*b*
11	3521	,,	Ca	=D	6·3
13	3523	45	Bh	h−10, =1, 6+15	6·2
14	3524	B	Cn	1−6, 3+1	6·9
14	3524	,,	Ca	=1	6·3
14	3524	30	Bn	1+1	6·2
17	3527	45	Bh	h−15, 6+10	6·7
19	3529	B	Ca	1 (3) v (5) 2	6·6
22	3532	,,	Cn	3+1	6·9
26	3536	30	Bn	1+1	6·2
28	3538	B	Cn	3−3	7·3
29	3539	45	Bh	2+2	6·9
May					
1	3541	47	Gi	1 (1·5) v (2·5) 3	6·6*b*
3	3543	45	Bh	2−1	7·2
5	3545	30	Bn	1 (3) v (1) 3	6·9
6	3546	B	Cn	5+1, 6+2	7·6
6	3546	30	Sm	=1	6·3
7	3547	B	Cn	5+1, =6	7·7
10	3550	,,	,,	=6	7·8
11	3551	,,	Gl	=4	7·6
12	3552	,,	Cn	=6	7·8
12	3552	32	Ca	=3	7·0
15	3555	51	Ma	6+3	7·5
17	3557	30	Bn	3 (3) v (1) 6	7·6
17	3557	45	Bh	2−5	7·6
20	3560	B	Cn	=6	7·8
21	3561	51	Ma	6+7	7·1
30	3570	45	Bh	=6	7·8
June					
2	3573	32	Ca	=6	7·8
8	3579	65	Gl	=H	7·1*b*
10	3581	B	Cn	6−8	8·6*b*
11	3582	45	Bh	6−4	8·2*b*
13	3584	65	Gl	H−2, 6+5	7·3
17	3588	30	Sm	=6	7·8
21	3592	65	Gl	H−6, 6+1	7·7
21	3592	45	Bh	6−7, 7−7	8·6*b*
27	3598	65	Gl	H−4, 6+3	7·5
July					
2	3603	30	Sm	=11	8·5
3	3604	32	Ca	11 (2) v (3) 14	8·7
4	3605	65	Gl	H−5, 6+2	7·6
14	3615	30	Sm	11 (2) v (2) 14	8·7
19	3620	65	Gl	6−5·5, 14+5·5	8·4
20	3621	30	Sm	11 (2) v (2) 14	8·7
26	3627	65	Gl	6−9, 14+2	8·7
Aug					
1	3633	,,	,,	6−10, 14+1	8·8
1	3633	30	Sm	=14	9·0
11	3643	,,	,,	=14	9·0*b*
17	3649	65	Gl	6−9, 14+2	8·7
20	3652	30	Sm	=14	9·0
Sept					
3	3666	65	Gl	6−10, 14+1	8·8

April 14, Bn, With B, 6·2.
May 1, Aperture reduced to 4-in.

(4826) R HYDRÆ—*continued.*

1923 Sept					
5	3668	20	Sm	=14	9·0
Nov					
9	3733	45	Bh	6−4	8·2*b*
19	3743	,,	,,	6−1	7·9*b*
Dec					
4	3758	,,	,,	2−5	7·6
14	3768	32	Ca	2 (5) v (2) 6	7·6
24	3778	45	Bh	2−1, 6+6	7·2
1924 Jan					
3	3788	45	Bh	2 (1) v (3) 6	7·3
6	3791	50	Bn	3 (1) v (2) 6	7·3
11	3796	45	Bh	=2	7·1
14	3799	25	Bn	3 (1) v (3) 6	7·2
16	3801	45	Bh	2+2	6·9
18	3803	B	Ca	3 (3) v (2) 2	7·1
20	3805	10	Ry	q+3	7·0*b*
23	3808	45	Bh	2+5	6·6
26	3811	,,	,,	h (3) v (1) 2, 2+5	6·6
31	3816	,,	,,	h (1) v (1) 2	6·1
Feb					
1	3817	F	Bn	1+2	6·1
2	3818	B	Ca	O (6) v (1) 1	6·2
3	3819	30	Sm	1+5	5·8
4	3820	B	Bn	m+1	5·8
6	3822	NE	Ca	O (6) v (1) 1	6·2
8	3824	B	D	m+3	5·6*b*
9	3825	,,	Gl	Q−3·5, 1+3·5	5·9
11	3827	45	Bh	h (1) v (3) 2	5·6
12	3828	30	Sm	1+8	5·5*b*
13	3829	B	Cn	h−7, 1+6	5·8
14	3830	,,	Bn	h (1) v (1) k	5·2
14	3830	NE	Ca	m (1) v (3) 1	6·0
14	3830	B	D	=k	5·3*b*
14	3830	45	Bh	h (1) v (3) 2	5·6
15	3831	NE	Ca	k (4) v (2) m	5·7
16	3832	,,	,,	k (3) v (3) m	5·6
16	3832	B	Bn	h−2·5	5·3
20	3836	,,	Sm	=h	5·1*b*
20	3836	,,	Gl	=h	5·1
21	3837	,,	Cn	=h	5·1
22	3838	45	Bh	h (1) v (4) 2	5·5
24	3840	B	Bh	h−2	5·3
24	3840	,,	Cn	=h, g+1	4·9
24	3840	,,	Gl	a−11·5, g+4, h+6	4·4
26	3842	,,	,,	a−10, g+5, h+8·5	4·3
26	3842	NE	Cn	h+1, g+2	4·8
26	3842	B	Bh	=h	5·1
26	3842	NE	Ca	=g	4·8
27	3843	,,	,,	S (1) v (1) g	4·7
28	3844	B	Bh	=h	5·1
28	3844	NE	Sm	=f	4·4*b*
28	3844	B	D	f−3, g+1	4·7
29	3845	NE	Cn	T−2, h+1	4·8
29	3845	,,	Ca	R (2) v (1) S	4·5
Mar					
2	3847	B	Bh	h+3	4·8*b*
3	3848	,,	Gl	a−5, g+9·5, h+13	3·8
3	3848	NE	Ca	R−1, =F	4·4
4	3849	,,	,,	e (2) v (1) f	4·3
4	3849	B	Bn	g (2) v (1) h	5·0
4	3849	,,	D	f−3, g+1	4·7
1924 Mar					
4	3849	NE	Sm	f+2	4·2
4	3849	B	Bh	d−6, h+2	4·7*b*
6	3851	NE	Gl	a−4, g+11	3·7
7	3852	B	Bh	a−13, h+5	4·6*b*
8	3853	,,	Bn	g (3) v (1) h	5·0
8	3853	NE	Ca	e (2) v (1) f	4·3
8	3853	B	D	a (3) v (2) h, E−2	4·4
9	3854	,,	Bh	a−12, h+6	4·5*b*
9	3854	NE	Gl	a−6, g+9	3·9
9	3854	,,	Cn	b−5, T+1, h+7	4·2
10	3855	,,	Ca	e (1) v (2) f	4·3
10	3855	,,	D	f−3, g+2	4·7
11	3856	,,	,,	f−2, g+2	4·6
11	3856	B	Bh	a−12, h+6	4·5*b*
11	3856	NE	Cn	b−5, T+3, h+6	4·2
12	3857	B	Bn	g (3) v (1) h	5·0
12	3857	NE	Ca	=E	4·2
13	3858	,,	Sm	b−5	4·0
13	3858	,,	D	f−1, g+3	4·5
13	3858	,,	Gl	a−4, g+11	3·7
14	3859	,,	Ca	=E	4·2
14	3859	B	Bh	a (3) v (2) h	4·4*b*
16	3861	NE	D	f−2, g+3	4·6*b*
16	3861	,,	Ca	=E	4·2
18	3863	,,	,,	=E	4·2
18	3863	,,	Cn	b−5, T+3	4·1
19	3864	B	Bh	a (1) v (1) h	4·2*b*
22	3867	,,	,,	a (1) v (2) h	3·0*b*
23	3868	NE	Sm	b−2·5	3·8
23	3868	B	Gl	a−3, g+12	3·0
23	3868	NE	Cn	b−4, T+5	3·9
25	3870	,,	Ca	=E	4·2
26	3871	B	Bh	a (1) v (2) h	3·9
27	3872	,,	Gl	a−4, g+11	3·7
29	3874	,,	Bh	a (1) v (1) h	4·2
29	3874	NE	Sm	b (3) v (2) e	3·9
29	3874	,,	Ca	=E	4·2
29	3874	,,	Cn	b−5, T+2	4·1
29	3874	B	Bn	f (3) v (2) g	4·6
30	3875	NE	D	f−2, g+2	4·6
30	3875	B	Gl	a−3·5, g+12, h+14	3·6
31	3876	,,	,,	a−5, U+4	3·7
31	3876	NE	Ca	=E	4·2
Apr					
1	3877	,,	Wi	g+3	4·5
1	3877	,,	Bn	f (2) v (1) g	4·7
2	3878	,,	Ca	e (1) v (2) f	4·3
2	3878	B	Bh	a (3) v (2) h	4·4*b*
4	3880	NE	Sm	b−5, =d	4·0
4	3880	,,	Cn	b−6, T+2	4·2
4	3880	B	Gl	a−4·5, U+4, g+11	3·7
4	3880	,,	Bn	f (3) v (1) g	4·7
5	3881	,,	Ma	h+5	4·6
5	3881	NE	Ca	E−1, =R	4·3
5	3881	,,	Cn	b−8, T+7	4·0*b*
6	3882	,,	,,	b−6, T+1	4·2
6	3882	B	Bh	h+6	4·5
7	3883	,,	Bn	g (1) v (2) h	4·9
7	3883	NE	Gl	a−6, U+3, g+9	3·8
7	3883	,,	Ca	E−1, =R	4·3
7	3883	B	Ma	a−8, h+5	4·3
7	3883	,,	Wi	g+2	4·6
8	3884	,,	,,	g+4	4·4
8	3884	,,	Bh	h+4	4·7

Jan. 31, With B, 6·1.
Feb. 11, 14, Bh, With B, 5·6.
Feb. 14, D, About.
Feb. 22, With B, 5·5.

Mar. 6, Orange.

(4826) R HYDRÆ—*continued.*

1924					
Apr					
8	3884	B	Ma	a−8, h+3	4·4*b*
9	3885	,,	,,	a−12, h+5	4·5
9	3885	..	Bn	f (2) v (1) g	4·7
9	3885	NE	Ca	=R	4·3
10	3886	,,	Sm	d (1) v (1) e	4·1
11	3887	B	Bh	h+5	4·6
11	3887	,,	D	g+1	4·7
11	3887	NE	Gl	a−5, g+10	3·8
11	3887	,,	Ca	e (2) v (1) f	4·3
14	3890	,,	,,	R (2) v (1) S	4·5
16	3892	B	Bh	a (4) v (1) h, h+3	4·7
16	3892	,,	Gl	a−11, g+4	4·4
16	3892	NE	Cn	=T	4·4
17	3893	,,	,,	T−2, h+7	4·5
20	3896	B	Bn	g (1) v (1) h	4·9
23	3899	NE	Sm	=f	4·4
23	3899	,,	Ca	g (1) v (2) h	4·9
24	3900	,,	,,	g (2) v (1) h	5·0
25	3901	,,	Ry	g−3·5, =h, W+4·5	5·0
25	3901	B	Bh	h+2	4·9
25	3901	,,	Gl	a−12, g+3	4·5
26	3902	NE	Ca	=h	5·1
27	3903	,,	Wi	g−3, k+2	5·1
27	3903	,,	Cn	T−5, h+2	4·9
28	3904	,,	Gl	a−14, h+4	4·7
28	3904	,,	Sm	=g	4·8
30	3906	B	Bh	=h	5·1
May					
1	3907	,,	Wi	k+1	5·2
1	3907	NE	Ca	h (1) v (1) k	5·2
1	3907	B	Ma	h−2	5·3*b*
1	3907	,,	Bn	g−3, h+1·5	5·0
3	3909	NE	Sm	g (1) v (1) h	4·9
4	3910	,,	Ca	=k	5·3
4	3910	B	Ma	h−2	5·3
4	3910	NE	Cn	g−1, =h	5·0
5	3911	B	D	h+1	5·0
5	3911	,,	Wi	g−4, k+1	5·2
5	3911	,,	Bh	=h	5·1
5	3911	,,	Gl	g−2, h+1	5·0
5	3911	,,	Bn	h−1	5·2
7	3913	,,	D	=h	5·1
8	3914	,,	Ma	h−5	5·6
8	3914	B	Wi	k+1	5·2
10	3916	,,	Bh	h−2	5·3
10	3916	,,	Gl	h−2, Q+3	5·2
11	3917	NE	Cn	g−4, h−4, k+4	5·2
11	3917	B	Sm	k (1) v (1) m	5·6*b*
12	3918	,,	Ca	h (4) v (2) l	5·4
13	3919	,,	D	h−3	5·4*b*
16	3922	,,	Bh	=h	5·1*b*
16	3922	,,	Ma	<h	<5·1
21	3927	,,	Gl	m−3, M+3	6·2
22	3928	,,	Bh	h−5	5·6*b*
23	3929	,,	Ca	=l	5·6
24	3930	,,	Sm	m−3	6·2
25	3931	NE	Ca	l (1) v (2) m	5·7
25	3931	B	D	h−5	5·6*b*

April 8, Ma, With 51, inclined to red.
April 9, Ma, Reddish.
May 13, Difficult.
May 16, Ma, Invisible.
May 25, D, About.

1924					
May					
25	3931	B	Cn	m+2	5·7
26	3932	51	Ma	6+20	5·8*b*
27	3933	NE	Ca	l (3) v (2) L	5·9
27	3933	B	Bn	m+1	5·8
28	3934	,,	Gl	g−9, m+2	5·7
29	3935	NE	Ca	m (2) v (3) 1	6·0
June					
1	3938	,,	,,	m (3) v (2) 1	6·1
1	3938	B	D	m−3, 1+2	6·1
1	3938	,,	Gl	=m	5·9
4	3941	,,	Ca	m (4) v (1) 1	6·2
8	3945	,,	Cn	1+1, 2+3	6·5
9	3946	,,	Ca	=β	6·5
11	3948	,,	Gl	=M	6·5*b*
18	3955	30	Sm	6+10	6·8*b*
21	3958	F	Ry	1−5, =3, =2	7·0
21	3958	B	Gl	1−1, M+1	6·4
22	3959	,,	Cn	=3	7·0
25	3962	30	Sm	6+8	7·0
27	3964	13	Ry	3−0·5, 2−1·5, 5+5	7·2
28	3965	B	Gl	1−3, 3+4	6·6*b*
30	3967	,,	Cn	3+1, 4+4, 5−1	7·3
July					
2	3969	F	Sm	=2	7·1
6	3973	B	Gl	3−5, 2+5	7·1
7	3974	13	Ry	3−3·5, =5	7·5
9	3976	32	Ca	1 (7) v (1) 2	7·0
11	3978	65	Gl	1−4, 3+3	6·7
12	3979	30	Sm	1 (5) v (3) 2	6·8
19	3986	B	Cn	=6	7·8
21	3988	,,	,,	6−1	7·9
21	3988	32	Ca	5 (1) v (1) 6	7·8
25	3992	20	Ry	5−4, 8+2·5	8·1
25	3992	B	Cn	6−3	8·1
Aug					
1	3999	65	Gl	3−5, 6+3	7·5
3	4001	B	Cn	6−6, 11+2	8·4*b*
3	4001	32	Ca	=6	7·8
4	4002	30	Sm	=6	7·8
7	4005	65	Gl	3−4, 6+4	7·4
16	4014	30	Sm	=7	8·0
17	4015	B	Cn	14+4	8·6
21	4019	65	Gl	6−5, 14+6, 17+11	8·3*b*
25	4023	30	Sm	8 (1) v (4) 14	8·5
29	4027	65	Gl	6−4, 14+8, 17+11	8·2
31	4029	30	Sm	=11	8·5
Nov					
16	4106	45	Bh	6−10	8·8*b*
29	4119	32	Ca	14 (2) v (1) 17	9·2
Dec					
1	4121	45	Bh	6−10	8·8*b*
4	4124	,,	,,	6−10	8·8*b*
9	4129	34	Li	8 (5) v (5) 11	8·4*b*
13	4133	45	Bh	6−10	8·8*b*
19	4139	,,	,,	6 (2) v (1) 17	8·8
23	4143	32	Ca	=14	9·0
24	4144	50	Bn	7+1	7·9
24	4144	45	Bh	6 (2) v (1) 14, 6 (1) v (1) 17	8·6
28	4148	,,	,,	6 (1) v (3) 17	8·2
28	4148	50	Bn	6 (7) v (1) 7	8·0
31	4151	45	Bh	6 (1) v (4) 17	8·1*b*

May 26, Pale red. With B, 7·1.
July 25, Ry, t.

(3493) R LEONIS. (V. 1.)

H.D. 094211.

Star B = ω Leonis, $5^{m}\cdot52$, **H.A., 50,** 93.

Date.	Julian Date.	Inst.	Observer.	Comparisons.	Deduced Mag.
1920 Jan					
1	2325	90	Bh	u−2, y+4	9·2*b*
5	2329	,,	,,	u−2, y+5	9·2
5	2329	22	Bl	=u	9·0
9	2333	45	Bh	=u	9·0
11	2335	22	Bl	u (2) v (5) y	9·2
13	2337	45	Br	u+2	8·8
13	2337	50	Ma	u (1) v (1) y	9·3*b*
14	2338	30	D	u−1, y+5	9·1
15	2339	90	Bh	u+3	8·7
15	2339	,,	Wh	=y	9·6
16	2340	23	Bo	t (1) v (1) 12	8·9
18	2342	60	Ga	u−2, y+5	9·2
19	2343	23	Bo	t (1) v (3) 12	8·9
19	2343	30	Bn	s (1) v (1) u	8·8
19	2343	,,	D	u−1, y+5	9·1
19	2343	22	Bl	t (2) v (2) u	8·9
21	2345	79	Ma	u+4, y+10	8·6
21	2345	30	D	p (4) v (1) u, u+2	8·8
21	2345	90	Bh	p−4, u+8	8·3
21	2345	30	Bn	s (1) v (4) u	8·7
23	2347	22	Bl	q (3) v (2) t	8·6
23	2347	23	Bo	q (1) v (3) t	8·4
24	2348	50	Ma	h (4) v (1) u	8·5
24	2348	30	Bn	q (1) v (1) s	8·4
24	2348	90	Bh	n−5, u+10	8·0
26	2350	45	Br	=n	7·5
26	2350	,,	Bh	=n	7·5
28	2352	30	D	p−5, u+5	8·5
31	2355	45	Bh	m−1, n+1	7·4
31	2355	30	Bn	o (1) v (1) q	7·9
Feb					
1	2356	23	Bo	k (3) v (1) m	7·1
2	2357	22	Bl	k (7) v (1) n	7·4
4	2359	45	Bh	m+1, n+4	7·1*b*
5	2360	22	Bl	k (1·5) v (4·5) m	6·8
6	2361	23	Bo	k (2) v (1) m	7·0
6	2361	60	Ga	=m, n+3	7·2*b*
6	2361	40	Hw	f (4) h (6) v	7·3*b*
6	2361	50	Ma	f (3) h (2) v, h−6	6·9
7	2362	45	Bh	h−5, k−2	6·9
8	2363	30	Bn	m (3) v (1) o	7·6
8	2363	45	Br	k−3, m+3	6·9
11	2366	23	Bo	k (1) v (3) m	6·8
11	2366	45	Bh	h−2	6·6
13	2368	90	,,	h+1	6·3
14	2369	22	Bl	=h	6·4
15	2370	23	Bo	h (1) v (3) k	6·5
15	2370	30	D	k−3, m+3	6·9
17	2372	90	Wh	h (2) v (1) m	7·0
17	2372	40	Hw	f (5) h (5) v	7·0
17	2372	30	Bn	h (1) v (4) k	6·5

Jan. 18, t.
Jan. 24, Ma, Red.
Feb. 6, Ga, t. Ma. Red.

Date.	Julian Date.	Inst.	Observer.	Comparisons.	Deduced Mag.
1920 Feb					
18	2373	30	D	k−1, m+5	6·7*b*
18	2373	79	Ma	h (1) v (2) u	7·3*b*
19	2374	50	,,	f (3) h (2) v, h−3	6·8
19	2374	23	Bo	f (4) v (1) h	6·3
19	2374	22	Bl	f (4) v (1) h	6·3
20	2375	30	Tn	=k	6·6
21	2376	45	Br	f−3, h+3	6·1
21	2376	50	Ma	h−2	6·6
22	2377	23	Bo	f (4) v (1) h	6·3
22	2377	30	D	k−1, m+5	6·7*b*
22	2377	22	Bl	f (5) v (1) h	6·3
23	2378	45	Bh	h+1	6·3
24	2379	40	Hw	f (1) h (2) v	6·6
24	2379	50	Ma	h−2·5	6·7
26	2381	,,	,,	h−2	6·6
27	2382	90	Bh	h+2	6·2
28	2383	23	Bo	f (2) v (1) h	6·2
28	2383	22	Bl	f (1) v (4) h, =f	5·9
Mar					
2	2386	50	Ma	h+1	6·3
3	2387	40	Hw	=h	6·4
3	2387	45	Bh	h+2	6·2
3	2387	23	Bo	=h	6·4
4	2388	22	Bl	f (1) v (5) h	5·9
7	2391	45	Bh	f−2, h+4	6·0
7	2391	30	Bn	f (1) v (2) h	6·0
7	2391	,,	Tn	h−2	6·6
8	2392	23	Bo	f (1) v (2) h	6·0
8	2392	50	Ma	=h	6·4
10	2394	30	Tn	=h	6·4
11	2395	79	Ma	=h	6·4
11	2395	90	Bh	f−3, h+3	6·1
11	2395	45	Br	f+1	5·7
12	2396	23	Bo	f (1) v (2) h	6·0
12	2396	30	Bn	f (1) v (2) h	6·0
12	2396	,,	D	h−1, k+2	6·5*b*
12	2396	40	Hw	f (5) v (5) h	6·1
13	2397	22	Bl	f (2) v (3) h	6·1
13	2397	30	Tn	h−1	6·5
15	2399	,,	,,	h−1	6·5
15	2399	50	Ma	=h	6·4
15	2399	30	D	f−4·5, h+1·5	6·3
16	2400	23	Bo	f (1) v (2) h	6·0
17	2401	...	Tn	h−1	6·5*b*
17	2401	90	Bh	=f, h+5	5·9
18	2402	30	Bn	f (3) v (1) h	6·3
18	2402	,,	D	h+0·5	6·4

Feb. 18, Ma, Pale red. Difficult.
Feb. 20, Very red.
Feb. 21, Mar. 15, Ma, Red.
Mar. 2, Reddish.
Mar. 8, Ma, Pale red.
Mar. 12, D, Difficult.
Mar. 17, Tn, 12½-in. mirror.

(3493) R LEONIS—*continued.*

1920					
Mar					
18	2402	22	Bl	f (3) v (3) h	6·1
19	2403	23	Bo	f (1) v (3) h	6·0
19	2403	50	Ma	h+1	6·3
21	2405	60	D	f−4, h+2	6·2
21	2405	90	Bh	f−3, h+3	6·1
22	2406	22	Bl	f (1) v (4) h	6·0
22	2406	30	Tn	=h	6·4*b*
22	2406	40	Hw	f (7) v (3) h	6·3
22	2406	30	Bn	f (4) v (1) h	6·3
23	2407	90	Bh	f−3, h+3	6·1
23	2407	30	D	f−4, h+3	6·2
23	2407	50	Ma	h+1·5	6·3
29	2413	22	Bl	f (3) v (5) h	6·1
30	2414	30	D	f−4, h+3	6·2*c*
30	2414	23	Bo	f (2) v (1) h	6·2
31	2415	90	Bh	=h	6·4
Apr					
5	2420	22	Bl	f (6) v (2) h	6·3
6	2421	30	D	f−4, h+2	6·2
6	2421	23	Bo	f (3) v (1) h	6·3
10	2425	90	Bh	h−3, =k	6·7
10	2425	B	Ma	h−4	6·8*c*
10	2425	22	Bl	=h	6·4
11	2426	30	D	k−2, m+4	6·8
12	2427	,,	Bn	h−1	6·5*b*
12	2427	90	Bh	h−3	6·7
13	2428	50	Ma	h−4	6·8
15	2430	22	Bl	h (1) v (4) k	6·5
15	2430	23	Bo	h (1) v (4) k	6·5
16	2431	160	Br	h+1	6·3
16	2431	30	D	h−5, m+3	6·9
17	2432	45	Bh	k−2	6·8
19	2434	50	Ma	h−6	7·0
21	2436	,,	,,	h−7	7·1
21	2436	30	Bn	h (2) v (1) k	6·6
21	2436	45	Bh	h−5, k−2, m+3	6·9
21	2436	30	D	h−7, m+1	7·1
22	2437	,,	Tn	h (7) v (3) m	7·0*b*
22	2437	22	Bl	h (5) v (1) k	6·6
23	2438	30	D	h−5, m+2	7·0*b*
27	2442	45	Bh	h−4, m+4	6·8*b*
28	2443	50	Ma	h−5	6·9
29	2444	,,	,,	h−7	7·1
29	2444	30	Bn	h (1) v (2) m	6·8
May					
2	2447	50	Ma	h−8	7·2
3	2448	22	Bl	=m	7·2
3	2448	30	Bn	k (4) v (1) m	7·1
4	2449	90	Bh	h−6, k−3	7·0
4	2449	50	Ma	h−9	7·3
4	2449	90	Wh	h (1) v (1) t	7·6*b*
7	2452	45	Br	k+3, m+2	7·0
7	2452	30	Bn	o (1) v (2) q	7·9
7	2452	50	Ma	h−10	7·4
9	2454	,,	,,	h (2) v (3) u, h−10	7·4
9	2454	22	Bl	m (2) v (1) n	7·4
9	2454	30	D	m−5, p+3	7·7

Mar. 19, Ma, Pale red.
Mar. 21, D, With B, 6·4.
Mar. 23, Ma, Reddish orange.
April 13, Orange red.
April 16, Br, Orange red.
April 19, Red.
April 29, Ma, Deep red.
May 4, May 7, Ma, Red.
May 9, Ma, Very difficult.

1920					
May					
10	2455	30	D	m−6, p+2	7·8
12	2457	45	Bh	k−6, =m	7·2*b*
13	2458	90	,,	k−3, m+3	6·9
13	2458	30	Bn	o (1) v (1) q, 6 (2) v (3) q	7·8
14	2459	50	Ma	h (2) v (1) u	8·1
14	2459	22	Bl	=m, n+2	7·3
17	2462	90	Wh	u+5	8·5
18	2463	50	Ma	h (3) v (2) u	8·0
19	2464	45	Br	=n	7·5
19	2464	30	Bn	o (2) v (1) q	8·0
21	2466	45	Bh	=m	7·2
22	2467	50	Ma	h (4) v (1) u	8·5
22	2467	90	Wh	t+2	8·7
23	2468	45	Bh	=m, =n	7·4
25	2470	30	D	m−5, p+3	7·7*b*
29	2474	,,	Bn	o (3) v (1) q	8·1
June					
1	2477	,,	,,	q+2	8·0
2	2478	45	Bh	n−2, p+4	7·6*b*
2	2478	50	Ma	u+6	8·4*b*
3	2479	,,	,,	h (6) v (1) u, u+7	8·5*b*
4	2480	45	Bh	=p	8·0*b*
5	2481	50	Bn	=q	8·2
8	2484	45	Br	n−3	7·8*b*
Sept					
16	2584	90	Bh	=y	9·6*b*
22	2590	,,	,,	=y	9·6
25	2593	,,	,,	u−4, y+2	9·4
28	2596	94	Bl	u+1·5	8·8
Oct					
2	2600	90	Bh	u+1	8·9
6	2604	45	Bh	u+3	8·7
9	2607	90	,,	u+3, y+10	8·7
10	2608	94	Bl	u (3) v (2) y	9·4*b*
12	2610	55	Bo	t (3) v (1) u	8·9
18	2616	22	Bl	t+0·5	8·8*b*
18	2616	90	Bh	u+5	8·5*b*
22	2620	,,	,,	n (2) v (1) u	8·5*b*
22	2620	55	Bo	q (1) v (3) t	8·4
25	2623	50	Bn	q−4, s+1	8·6
26	2624	22	Bl	n (5) v (1) q	8·1
29	2627	45	Bh	n (1) v (2) u	8·0*b*
Nov					
1	2630	,,	,,	n−5, u+10	8·0
1	2630	22	Bl	q (1) v (5) t	8·3
7	2636	55	Bo	7 (3) v (1) p	8·0
8	2637	22	Bl	n (5) v (1) q	8·1
8	2637	45	Bh	n−4, u+10	7·9
11	2640	,,	,,	n−3	7·8
16	2645	,,	,,	n (1) v (3) u	7·8
16	2645	22	Bl	n (5) v (1) q	8·1
18	2647	30	D	p (3) v (1) u, u+3	8·7
18	2647	23	Bo	q (1) v (3) t	8·4
20	2649	45	Bh	n−1	7·6
21	2650	50	Bn	q−1	8·3*b*
22	2651	23	Bo	q (1) v (3) t	8·4
23	2652	22	Bl	n (3) v (3) q	7·8
23	2652	30	Tn	n (5) v (5) 13	8·2*b*
30	2659	45	Bh	n+2	7·3
Dec					
3	2662	30	Tn	=n	7·5

May 25, June 8, Difficult.
June 3, Reddish.
Sept. 16, 22, Reddish.
Nov. 21, Very red.

(3493) R LEONIS—*continued.*

1920 Dec					
7	2666	45	Bh	h−6, n+3	7·1
8	2667	30	Tn	m+3	6·9
10	2669	45	Bh	h−2	6·6
12	2671	,,	,,	=h	6·4
14	2673	22	Bl	f (3) v (3) h	6·1
14	2673	30	Tn	=h	6·4
17	2676	90	Bh	=f, h+4	5·9
21	2680	45	,,	f+2, h+6	5·7
22	2681	30	Tn	f (3) v (7) h	6·0
25	2684	90	Bh	f+2, h+6	5·7
28	2687	45	,,	f+4, h+8	5·5*b*
31	2690	,,	,,	f+1, h+6	5·7
31	2690	,,	Br	f+1	5·7
1921 Jan					
2	2692	F	Mu	d−3, e−1, f+1	5·7
4	2694	B	Ca	B−1·5, f+1	5·7
5	2695	80	Co	=f	5·8
5	2695	F	Mu	d−3·5, e−1, f+1	5·8
5	2695	22	Bl	=f	5·8
6	2696	30	Tn	f (2) v (8) h	6·0
7	2697	F	Mu	d−3·5, e−1·5, f+1	5·8
7	2697	45	Bh	f+2, h+8	5·6
9	2699	80	Co	=f	5·8
9	2699	F	Mu	d−4, e−2, =f	5·8
10	2700	45	Bh	f+2, h+6	5·7
12	2702	22	Bl	f+0·5	5·8
12	2702	F	Mu	d−4·5, e−2·5, f−1	5·9
12	2702	80	Co	=f	5·8
12	2702	30	Bn	f (1) v (1) h	6·1*b*
13	2703	,,	Tn	f (2) v (8) h	6·0
13	2703	90	Bh	f+1, h+5	5·8
14	2704	45	Br	f+2	5·6
14	2704	22	Bl	f+0·5	5·8
14	2704	30	D	f−2, h+4	6·0
15	2705	50	Ma	f (1) v (4) h	6·0
15	2705	80	Co	=f	5·8
15	2705	30	Bn	f (2) v (1) h	6·2
16	2706	23	Bo	e (3) v (1) f	5·8
21	2711	90	Bh	=f, h+4	5·9
22	2712	80	Co	f−1	5·9
24	2714	45	Bh	=f, h+5	5·9
26	2716	30	Tn	f (5) v (5) h	6·1
27	2717	23	Bo	f (1) v (3) h	6·0
28	2718	50	Bn	f (1) v (2) h	6·0*b*
30	2720	B	Ca	f−3·5, h+2	6·2
31	2721	55	Bo	f (1) v (1) h	6·1
31	2721	50	Ma	=h	6·4
31	2721	48	Wi	h−2, =k	6·6
Feb					
1	2722	22	Bl	f (3·5) v (1·5) h	6·3
1	2722	F	Mu	e−4, f−2·5, h+3·5	6·1
1	2722	50	Bn	f (2) v (1) h	6·2
2	2723	90	Bh	f−2, h+4	6·0
2	2723	50	Ma	h+1	6·3
2	2723	60	Co	f−4, h+2	6·2

Jan. 5, Co. Orange red. Mu, Rather hurried.
Jan. 7, Mu, Orange.
Jan. 9, Co, Red.
Jan. 12, Mu, Rather hurried. Co, Rich orange red. Bn, With B, 6·1.
Jan. 15, Ma, Pale red. Co, Red. Bn, With B, 6·2.
Jan. 22, Orange.
Jan. 31, Ma, With B, 6·4. Wi, Very red.
Feb. 2, Ma, Red. Co, Red.

1921 Feb					
3	2724	45	Br	=f	5·8
3	2724	F	Mu	f−2·5, h+3·5	6·1*b*
5	2726	55	Bo	f (3) v (1) h	6·3
5	2726	50	Ma	h+1·5	6·3
9	2730	,,	,,	=h	6·4
9	2730	F	Mu	f−3·5, h+2·5, k+4	6·2
9	2730	60	Co	f−4·5, h+1·5	6·3
9	2730	45	Bh	=f, h+5	5·9
10	2731	30	Tn	h−2	6·6
12	2733	22	Bl	f (4·5) v (1·5) h	6·3
14	2735	F	Bn	f (4) v (1) h	6·3
14	2735	45	Bh	f−2, h+4	6·0
14	2735	60	Co	h+1	6·3
14	2735	50	Ma	h−1	6·5
17	2738	,,	,,	h−1·5	6·6
17	2738	60	Co	=h	6·4
17	2738	30	Tn	h−3	6·7
17	2738	,,	D	h (3) v (2) m, m+5	6·8*b*
17	2738	45	Bh	f−3, h+3	6·1
19	2740	55	Bo	f (4) v (1) h	6·3
20	2741	90	Bh	h+1	6·3
20	2741	60	Co	=h	6·4
21	2742	40	Hw	=h	6·4
23	2744	50	Ma	h−2	6·6
23	2744	22	Bl	f (5) v (2) h	6·3
24	2745	55	Bo	h (1) v (3) k	6·5
24	2745	50	Bn	h (1) v (3) k	6·5
25	2746	160	Br	f−4, h+2	6·2
25	2746	90	Bh	=h	6·4
25	2746	30	Tn	m+3	6·9
25	2746	60	Co	h−2	6·6
26	2747	,,	,,	h−1	6·5
26	2747	50	Ma	h−2	6·6
27	2748	,,	,,	h−2·5	6·7
28	2749	32	Ca	l−1, m+2	7·0
Mar					
1	2750	50	Bn	h (1) v (3) k	6·5
1	2750	40	Hw	h (5) v (5) n	7·0
1	2750	60	Co	h−3, k−1	6·7
2	2751	55	Bo	h (1) v (3) k	6·5
2	2751	90	Bh	h−2	6·6
2	2751	30	Tn	h (7) v (3) m	7·0
2	2751	22	Bl	h (1) v (3) k	6·5
2	2751	48	Wi	m−4	7·6
2	2751	50	Ma	h−3	6·7
6	2755	45	Bh	h−2	6·6
7	2756	90	,,	h−4	6·8
7	2756	60	Co	k−1, =l	6·8
7	2756	40	Hw	h (8) v (2) n	7·3
7	2756	50	Ma	h−3·5	6·8
9	2758	30	Bn	k (1) v (2) m	6·8*b*
9	2758	48	Wi	m−3	7·5
10	2759	,,	,,	m−1, n+2	7·3
10	2759	22	Bl	h (4) v (1) k	6·6

Feb. 3, Br, Very red. Mu, Very red.
Feb. 5, 9, Ma, Rather pale red.
Feb. 9, 14, Co, Orange red.
Feb. 14, Ma, Crimson.
Feb. 17, 23, Ma, Pale red, not very deep.
Feb. 17, Co, Deep orange red.
Feb. 25, Br, Very red. Co, Deep red.
Feb. 26, Co, Red. Ma, Difficult.
Feb. 27, Red.
Mar. 1, Co, Deep orange red.
Mar. 2, Ma, Pale red inclining to orange.
Mar. 7, Ma, Dull red.

(3493) R LEONIS—*continued.*

1921					
Mar					
10	2759	40	Hw	h (5) v (5) n	7·0
10	2759	55	Bo	h (2) v (1) k	6·6
13	2762	60	Co	l−1, m+2	7·0
14	2763	50	Ma	h−5	6·9
15	2764	55	Bo	k (1) v (3) l	6·7
16	2765	90	Bh	h−4	6·8
16	2765	32	Ca	m−3, =n, o+1·5	7·5
17	2766	60	Co	m+2	7·0
18	2767	30	Bn	k (1) v (2) m	6·8
18	2767	50	Ma	h−5	6·9
20	2769	,,	,,	h−7	7·1*b*
20	2769	22	Bl	k (5) v (2) m	7·1
20	2769	60	Co	l−1·5, m+2	7·0*b*
21	2770	55	Bo	m (1) v (3) n	7·3
21	2770	45	Bh	h−3, k+2	6·6*b*
24	2773	,,	,,	h−5	6·9
24	2773	40	Hw	=n	7·5
24	2773	22	Bl	k (6) v (1) m	7·1
24	2773	60	Co	=m, n+2	7·3
24	2773	50	Ma	h (3) v (2) u, h−8	7·7
25	2774	48	Wi	m−5, n+3	7·7*c*
26	2775	30	Bn	m (2) v (1) o	7·5
26	2775	60	Co	m−1, n+1	7·4
29	2778	,,	,,	=n, 7+2	7·6
29	2778	55	Bo	n (1) v (2) p	7·7*b*
29	2778	90	Bh	h−2	6·6
30	2779	40	Hw	n (5) v (5) q	7·8
30	2779	50	Ma	h (1) v (1) u	7·7
30	2779	48	Wi	p−4, u+6	8·4
31	2780	60	Co	n−2, =7	7·8
Apr					
1	2781	30	Bn	o (5) v (2) q	8·1
1	2781	45	Bh	h−5	6·9
1	2781	22	Bl	m (1) v (4) q, =n	7·4
1	2781	48	Wi	p−3, u+7	8·3
2	2782	45	Br	=n	7·5
2	2782	55	Bo	n (1) v (3) p	7·6*b*
3	2783	30	D	n−4, p+0·5	7·9
3	2783	50	Ma	h (3) v (1) u	8·3
5	2785	32	Ca	q−2, =r	8·4
6	2786	80	Co	n−4, 7−1	7·9
7	2787	,,	,,	7−2, =q	8·2
7	2787	30	Tn	m−2	7·4*b*
7	2787	45	Bh	h−8, k−5, k (2) v (1) n	7·2
7	2787	48	Wi	u+8	8·2*b*
8	2788	50	Ma	h (3) v (1) u	8·3
9	2789	80	Co	q−1	8·3
10	2790	,,	,,	q−2	8·4
10	2790	50	Ma	h (4) v (1) u, u+6	8·4
10	2790	30	Tn	n−2	7·7
11	2791	22	Bl	n (2) v (2) q	7·8
12	2792	80	Co	q−2, t+3	8·5
12	2792	55	Bo	n (1) v (1) 7	7·7
12	2792	30	Bn	q (3) v (1) s	8·5
12	2792	45	Bh	m−2, n+1	7·4
12	2792	48	Wi	u+7	8·3*b*
14	2794	,,	,,	x+10	8·7*b*
14	2794	50	Ma	h (4) v (1) u, u+6	8·4

Mar. 13, 14, 17, Red.
Mar. 18, Ma, Pale pinky red.
Mar. 20, Ma, Very difficult. Co, Orange.
Mar. 24, Co, Red.
Mar. 29, 31, Co, Reddish.
April 3, Ma, Pale red.
April 14, Ma, Red.

1921					
Apr					
15	2795	30	D	p−2	8·2*b*
16	2796	22	Bl	n (4·5) v (1·5) q	8·0
16	2796	80	Co	t+3	8·6
18	2798	30	Tn	n (3) v (7) u	7·9
19	2799	55	Bo	7 (3) v (1) p	8·0*b*
19	2799	80	Co	t+1	8·8
21	2801	,,	,,	=t, 13+2	8·8
22	2802	,,	,,	t+1, 13+3	8·7
23	2803	,,	,,	=t, 13+1	8·9
23	2803	30	Bn	q (1) v (2) s	8·4
23	2803	45	Bh	n−3	7·8
23	2803	50	Ma	u+4, y+6	8·8
23	2803	48	Wi	u+5	8·5
25	2805	80	Co	13−1, u+1	9·0
27	2807	22	Bl	q (4) v (1) t	8·7
27	2807	48	Wi	u+5	8·5
28	2808	55	Bo	p (1) v (3) q	8·1
28	2808	45	Br	n−6	8·1
28	2808	30	Bn	s (1) v (3) u	8·7
29	2809	50	Ma	u+5, y+7	8·7
29	2809	45	Bh	n−2	7·7
30	2810	90	,,	n−3, u+12	7·8
May					
1	2811	30	D	u+1	8·9
1	2811	50	Bn	u+1	8·9
6	2816	32	Ca	w+2	8·9*b*
7	2817	90	Bh	n−4, u+10	7·9*b*
8	2818	48	Wi	u+4	8·6
8	2818	50	Ma	u+3·5, y+4·5	8·9
9	2819	,,	Bn	u−1	9·1
9	2819	45	Bh	n−10, u+5	8·5
10	2820	22	Bl	u+0·5	8·9
19	2829	,,	,,	=u	9·0
20	2830	55	Bo	q (3) v (1) t	8·7
21	2831	50	Bn	u (2) v (1) y	9·4
23	2833	45	Bh	n−12, u+2	8·7
23	2833	50	Ma	u (1) v (4) y	9·1
29	2839	,,	,,	u (3) v (1) y	9·5
June					
2	2843	160	Br	y+2	9·4
2	2843	150	Bh	u−1	9·1
7	2848	120	Bn	y−3	9·9*b*
7	2848	50	Ma	y−2	9·8
10	2851	150	Bh	u−3	9·3
15	2856	,,	,,	u−5	9·5
18	2859	,,	,,	u−5	9·5
29	2870	32	Ca	z−2	10·3
Sept					
16	2949	90	Bh	u+2	8·8*b*
30	2963	,,	,,	h−13, u+10	7·9
Oct					
5	2968	,,	,,	=n	7·5
6	2969	50	Bn	o (3) v (1) q	8·1
8	2971	90	Bh	h−8, n+2	7·3
9	2972	32	Ca	q−1, r+1	8·3
17	2980	90	Bh	h−1	6·5
18	2981	22	Bl	h (3·5) v (1·5) k	6·6

April 16, Co, About.
April 23, Ma, Very red.
April 28, Br, About.
May 8, Ma, Dull red.
May 29, Deep red.
June 7, Ma, Just held in twilight.
Sept. 16, Pale yellow.
Oct. 5, Orange.
Oct. 17, Deep orange.

(3493) R LEONIS—*continued.*

1921 Oct					
23	2986	90	Bh	h+1	6·3
27	2990	22	Bl	h (1) v (4) k	6·5
30	2993	90	Bh	f−3, h+3	6·1
Nov					
7	3001	45	Bh	f−2, h+4	6·0
9	3003	22	Bl	f (1) v (6) h, =f	5·9
12	3006	45	Bh	=f, h+5	5·9
17	3011	,,	,,	=f, h+4	5·9
23	3017	,,	,,	=f, h+5	5·9
23	3017	22	Bl	f+0·5	5·8
24	3018	30	D	f−2, h+4	6·0*b*
25	3019	45	Bh	=f, h+4	5·9
28	3022	22	Bl	f+1·5	5·7
29	3023	45	Bh	=f	5·8
Dec					
3	3027	90	,,	f−2, h+4	6·0
4	3028	80	Co	=f	5·8*b*
15	3039	90	Bh	h+3	6·1
17	3041	80	Co	f−3	6·1*c*
17	3041	22	Bl	=f	5·8
21	3045	90	Bh	h+1	6·3
22	3046	48	Wi	h−2, =k	6·6
23	3047	30	Bn	f (2) v (1) h	6·2
23	3047	45	Br	f−1, h+4	6·0
25	3049	80	Co	h+1	6·3
26	3050	90	Bh	f−6, =h	6·4
28	3052	30	Bn	f (3) v (1) h	6·3
28	3052	80	Co	h+1	6·3
29	3053	,,	,,	=h	6·4
29	3053	90	Bh	=h	6·4
30	3054	80	Co	=h	6·4*b*
1922 Jan					
3	3058	45	Br	f−2, h+4	6·0
3	3058	30	Bn	f (3) v (1) h	6·3
3	3058	90	Bh	h+1	6·3
3	3058	80	Co	h−1	6·5*b*
6	3061	22	Bl	f (3·5) v (1·5) h	6·3
10	3065	30	Bn	h−1	6·5
10	3065	45	Bh	=h	6·4
10	3065	48	Wi	h−5, m+3	6·9
11	3066	,,	,,	m+5	6·7*b*
12	3067	23	Bo	=h	6·4
12	3067	80	Co	h−1	6·5
17	3072	,,	,,	=m	7·2*b*
17	3072	23	Bo	h (1) v (2) k	6·5
18	3073	90	Bh	h−1	6·5
18	3073	22	Bl	h (3) v (3) k	6·5
20	3075	48	Wi	m−3	7·5
22	3077	22	Bl	=h	6·4*b*
28	3083	,,	,,	k (4) v (4) m	6·9
28	3083	80	Co	=m, n+1	7·3
29	3084	90	Bh	h−3, k−1	6·7*b*
30	3085	23	Bo	k (2) v (1) l	6·8
Feb					
1	3087	48	Wi	m−3	7·5
1	3087	40	Hw	h (7) v (3) n	7·2
1	3087	80	Co	=m, n+1	7·3*b*
2	3088	90	Bh	h−5, k−3	6·9
5	3091	,,	,,	h−2	6·8
5	3091	23	Bo	l (3) v (2) m	7·1
1922 Feb					
7	3093	80	Co	m−1·5, =n	7·4*b*
8	3094	23	Bo	l (3) v (1) m	7·1
8	3094	22	Bl	k (5·5) v (1·5) m	7·1
9	3095	25	Bn	k (2) v (1) m	7·0
10	3096	80	Co	l−4, m+2·5	7·1
13	3099	,,	,,	=m, n+2	7·3
13	3099	40	Hw	=n	7·5*b*
14	3100	22	Bl	m (1) v (1) n	7·4
14	3100	80	Co	m−3·5, =n	7·5
14	3100	23	Bo	l (3) v (2) m	7·1
17	3103	45	Br	k−6, n+3	7·2*b*
17	3103	30	Bn	k (5) v (1) m	7·1
17	3103	45	Bh	k+1	6·5
17	3103	50	Ma	h (6) v (1) u, u+6	8·5
18	3104	55	Bo	m (2) v (1) n	7·4
18	3104	32	Ca	=q	8·2
18	3104	80	Co	=7, p+1	7·9
18	3104	48	Wi	u+10	8·0
19	3105	50	Ma	h (1) v (1) u, u+7	8·0
20	3106	80	Co	7−2, =p	8·1
20	3106	27	Li	l (7) v (3) m	7·1
24	3110	50	Ma	h (3) v (1) u, u+6	8·4
25	3111	80	Co	q−2, t+2	8·5
25	3111	23	Bo	n (2) v (4) p	7·7
26	3112	48	Wi	u+8	8·2
26	3112	27	Li	l (8) v (2) m	7·2
26	3112	90	Bh	n+4	7·1
27	3113	80	Co	q−1, t+3	8·4
27	3113	22	Bl	n (1) v (2) q	7·7*b*
Mar					
2	3116	55	Bo	n (3) v (3) p	7·7
4	3118	45	Br	n−2	7·7
4	3118	,,	Bh	n−2	7·7
4	3118	32	Ca	q−1, r+1	8·3
4	3118	80	Co	t+1, 12+2·5	8·8
4	3118	40	Hw	n (3) v (7) u	7·9*b*
4	3118	90	Wh	=u	9·0
4	3118	28	Wi	u+10	8·0
7	3121	30	Bn	q (3) v (1) s	8·5
7	3121	48	Wi	u+7	8·3
7	3121	80	Co	=s, t+1·5	8·7
8	3122	55	Bo	n (4) v (1) p	7·9*b*
9	3123	28	Wi	u+5	8·5
9	3123	22	Bl	n (4) v (1) q	8·1
9	3123	50	Ma	h (4) v (1) u, h−10, u+6, y+8	8·3*b*
9	3123	80	Co	=s, t+1	8·7
14	3128	79	Ma	h (7) v (1) u, u+4, y+8	8·7*b*
16	3130	55	Bo	q (3) v (3) t	8·5*b*
16	3130	45	Bh	n−8, u+7	8·3
17	3131	90	,,	u+5	8·5
17	3131	22	Bl	=t	8·9*b*
17	3131	60	D	u+3	8·7*b*
18	3132	79	Ma	u+5, y+8	8·7
19	3133	90	Bh	u+1	8·9
20	3134	80	Co	u−1	9·1
20	3134	40	Hw	v (3) u (7) y	8·7
22	3136	90	Bh	u+2	8·8

Dec. 4, Ruddy.
Dec. 15, Orange.
Dec. 17, Co, About.
Jan. 12, Feb. 1, Co, Deep red.

Feb. 7, Mar. 18, Red.
Feb. 10, Scarlet.
Feb. 17, Ma, Pale red.
Feb. 18, Co, Dull red.
Feb. 19, 24, Delicate red.
Feb. 20, 26, Li, Orange red.
Mar. 14, Pale yellow.

(3493) R LEONIS—*continued.*

1922					
Mar					
22	3136	80	Co	u−1·5	9·1
23	3137	,,	,,	u−3, y+3	9·3
23	3137	55	Bo	u+2	8·8*b*
23	3137	50	Ma	u+4, y+6	8·8
25	3139	45	Br	u+3	8·7
25	3139	50	Bn	s (3) v (1) u	8·9
25	3139	32	Ca	w−3, y+2	9·4
28	3142	80	Co	u−5, y+1·5	9·5
28	3142	90	Bh	u+2	8·8
31	3145	,,	,,	u+2	8·8
Apr					
1	3146	80	Co	y+2	9·4
2	3147	,,	,,	=y	9·6*b*
2	3147	79	Ma	u (1) v (1) y	9·3*b*
4	3149	90	Bh	=u	9·0
4	3149	75	Bn	u (2) v (1) y	9·4
6	3151	94	Bl	u (4) v (2) y	9·4
10	3155	90	Wh	z+3	9·8
14	3159	,,	Bh	u−1	9·1
16	3161	160	Bo	y+2	9·4
17	3162	90	Bh	u−1	9·1
17	3162	80	Co	y−1	9·7
17	3162	79	Ma	u (1) v (1) y	9·3
18	3163	90	Wh	y (1) v (1) 24	10·0
18	3163	32	Ca	x−1, z+3	9·8
19	3164	75	Bn	y (2) v (1) z	10·0
19	3164	22	Bl	u (5) v (1) y	9·5
19	3164	80	Co	y−2·5	9·9
20	3165	33	Wi	u−2, y+4	9·2
20	3165	140	Bo	u (2) v (4) y	9·2
21	3166	80	Co	y−3, =z	10·0
23	3168	90	Bh	u−2	9·2
24	3169	33	Wi	u−2, y+4	9·2
27	3172	80	Co	y−3, =z	10·0
28	3173	94	Bl	u (1·5) v (3·5) y	9·2
29	3174	120	Wi	u−6, =y	9·6
29	3174	90	Bh	u−3, y+3	9·3
29	3174	75	Bn	z (1) v (2) a	10·2*b*
29	3174	45	Br	y−1	9·7
30	3175	32	Ca	z−1, a+2	10·2*b*
May					
2	3177	90	Bh	u−4, y+2	9·4*b*
5	3180	120	Wi	u−6, =y	9·6
6	3181	94	Bl	u (3) v (3) y	9·3*b*
6	3181	45	Bh	y+1	9·5
8	3183	120	Wi	u−4, y+1	9·5
12	3187	22	Bl	y−0·5	9·7
12	3187	90	Bh	=y	9·6
12	3187	80	Co	y−5, z−1	10·2*b*
14	3189	,,	,,	y−5, z−1	10·2*b*
14	3189	50	Bn	z (1) v (3) a	10·2
15	3190	70	Bo	z (1) v (2) 24	10·2*b*
15	3190	80	Co	y−5, z−1	10·2
15	3190	120	Wi	u−4, y+2	9·4
16	3191	32	Ca	z−1, a+2	10·2*b*
17	3192	45	Bh	y+1	9·5
17	3192	80	Co	=z	10·1*b*
19	3194	90	Wi	=y	9·6
19	3194	50	Bn	y (4) v (1) z	10·0
20	3195	31	D	y−4, x−3, z+2	10·0
21	3196	70	Bo	y (2) v (3) z	9·8*b*
21	3196	45	Bh	y−2	9·8

April 28, With 22, 9·7.
May 5, Red.
May 6, Bh, Orange.
May 17, Co, About.

1922					
May					
21	3196	80	Co	y−3·5, z+2	10·0
23	3198	79	Ma	u−3, x−2, y−1	9·6
25	3200	32	Ca	=z	10·1*b*
26	3201	90	Bh	y−3	9·9*b*
27	3202	160	Br	y−1	9·7
27	3202	50	Bn	y (1) v (2) z	9·8
27	3202	80	Co	y−2·5	9·9
28	3203	90	Wi	u−6, y+1	9·6
28	3203	31	D	y−2, z+3	9·8
28	3203	70	Bo	y (2) v (3) z	9·8
29	3204	22	Bl	=y	9·6
Sept					
1	3299	45	Bh	f−4, h+2, k+4	6·2*b*
9	3307	,,	,,	f−2, h+4	6·0*b*
21	3319	,,	,,	f−3, h+3	6·1
26	3324	,,	,,	=h	6·4*b*
Oct					
1	3329	,,	,,	f−2, h+4	6·0
6	3334	22	Bl	f+1	5·7*b*
7	3335	45	Bh	f−2, h+4	6·0
14	3342	,,	,,	f−2, h+4	6·0
14	3342	22	Bl	=f	5·8
24	3352	,,	,,	f (2) v (4) h	6·0
25	3353	45	Bh	f−5, =h	6·4
Nov					
11	3370	,,	,,	f−3, h+3	6·1*b*
14	3373	,,	,,	f−5, h+1	6·3
19	3378	,,	,,	=h	6·4*b*
24	3383	22	Bl	=h	6·4
25	3384	90	Bh	=h	6·4
Dec					
6	3395	,,	,,	h−2, =k	6·6
11	3400	,,	,,	f−6, h−3	6·6
14	3403	40	Hw	=n	7·5
14	3403	22	Bl	k (6) v (2) m	7·1*b*
16	3405	45	Bh	h−5, k−3, n+5	6·9
19	3408	,,	Br	=m	7·2
20	3409	31	D	n−3, p+2	7·8*b*
25	3414	90	Bh	n+2	7·3
26	3415	44	Wi	m−3, 13+6	8·0
1923					
Jan					
2	3422	,,	,,	m−3	7·5
4	3424	90	Bh	n−4, u+10	7·9
8	3428	44	Wi	13+4	8·6*b*
8	3428	90	Bh	n−7, u+7	8·2
9	3429	34	Li	l (8) v (2) m	7·2
10	3430	30	Co	q−2·5, t+2	8·6
12	3432	22	Bl	q (3) v (1) t	8·7
14	3434	,,	,,	n (5) v (1) q	8·1
14	3434	34	Li	l (8) v (2) m	7·2
14	3434	90	Bh	n−10, u+5	8·5
15	3435	30	Bn	s (1) v (2) u	8·8*b*
16	3436	,,	Co	=t	8·9
16	3436	...	Hw	=u	9·0
20	3440	45	Br	u+1	8·9
20	3440	34	Li	=7	7·9
23	3443	22	Bl	t (1) v (3) u	8·9
23	3443	31	D	u−1	9·1
23	3443	30	Co	u−2	9·2
24	2444	50	Bn	s (1) v (2) u	8·8
30	3450	90	Bh	n−12, u+3	8·7

Dec. 20, Difficult.
Jan. 8, Wi, Difficult.
Jan. 20, Li, Orange red.

(3493) R LEONIS—*continued.*

1923 Feb					
3	3454	90	Bh	u+3	8·7*b*
4	3455	,,	,,	=u	9·0
4	3455	30	Bn	q−3, s+1	8·5
4	3455	,,	Co	u−3, y+3	9·3
5	3456	...	Hw	=u	9·0
5	3456	34	Li	=p	8·0*b*
6	3457	22	Bl	=u	9·0
7	3458	160	Br	u−4, y+2	9·4
8	3459	90	Bh	u+1	8·9
11	3462	30	Co	=y	9·6*b*
16	3467	,,	,,	y−1·5, 18−1	9·8
17	3468	22	Bl	u (1) v (4) y	9·1*b*
21	3472	30	Co	y−4, z+2	10·0*b*
21	3472	34	Li	q (8) v (2) t	8·7
23	3474	...	Hw	=y	9·6*b*
26	3477	22	Bl	u (4) v (3) y	9·4
28	3479	90	Bh	u−4	9·4
Mar					
2	3481	,,	,,	u−2	9·2
5	3484	34	Li	s (8) v (2) u	8·9
5	3484	90	Wh	x (1) v (1) 25	10·0
5	3484	30	Co	y−4, z+3	9·9*b*
5	3484	79	Ma	u (4) v (1) y	9·5
6	3485	60	Wb	u (2) v (3) a	9·6
10	3489	50	,,	y−2, =x	9·8
13	3492	90	Bh	u−5	9·5
16	3495	30	Co	z−3·5	10·5*b*
17	3496	,,	,,	a−1	10·6
17	3496	75	Bn	y (4) v (1) z	10·0
17	3496	...	Hw	=z	10·1
17	3496	34	Li	=u	9·0
17	3496	90	Bh	u−6, =y	9·6
17	3496	60	Wb	u−2, 18 (3) v (2) y, =z	9·6
18	3497	50	,,	u (3) v (2) 25	9·8
18	3497	79	Ma	y−1	9·7
20	3499	94	Bl	u (2) v (2) y	9·3
21	3500	90	Bh	u−5, y+1	9·5
21	3500	50	Wb	y−1, =25	10·1
24	3503	30	Co	y−4, =z	10·1
24	3503	34	Li	=u	9·0
25	3504	90	Wh	25+2	10·2
26	3505	...	Hw	=y	9·6
27	3506	45	Bh	u−1, =y	9·7*b*
27	3506	94	Bl	u (3) v (3) y	9·3
31	3510	79	Ma	u (4) v (1) y	9·5
Apr					
1	3511	90	Bh	u−8, y−2	9·8
3	3513	30	Co	y−2	9·8*b*
4	3514	,,	,,	u−5, y+3	9·4
4	3514	22	Bl	=y	9·6
5	3515	79	Ma	u (2) v (1) y, y+1	9·5*b*
7	3517	75	Bn	y (2) v (1) z	10·0
7	3517	50	Wb	y (2) v (3) 25, 19−2, =z	10·0
8	3518	60	,,	y (2) v (3) z, y (2) v (3) 25	9·9
8	3518	94	Li	y (1) v (9) z	9·7
8	3518	90	Wh	y−3	9·9
8	3518	79	Ma	u (1) v (1) y	9·3

1923 Apr					
8	3518	31	D	y−4, z+2	1
8	3518	90	Bh	u−5, y+1	
13	3523	,,	,,	u−3, y+4	
13	3523	50	Wb	u (3) v (2) x, x (3) v (2) 25	
14	3524	,,	,,	y (1) v (4) z	
14	3524	30	D	y−2	
14	3524	120	Wi	u−3, y+1	
14	3524	50	Ma	u+1, y+2	
14	3524	34	Li	q (8) v (2) t	
14	3524	75	Bn	u (4) v (1) y	
16	3526	90	Bh	u−3, y+3	
19	3529	30	Co	y+2·5	
19	3529	34	Li	q (4) v (6) t	
19	3529	50	Ma	u+2, y+4	
19	3529	...	Wb	y (1) v (4) 25	
20	3530	45	Bh	u−3, y+3	
20	3530	30	D	=y	
20	3530	94	Bl	u+1·5	
23	3533	60	D	u (1) v (4) y, u (3) v (7) y	
26	3536	50	Ma	u+2	
27	3537	60	D	u−2	
28	3538	30	Co	=u	
29	3539	45	Bh	=u	
May					
2	3542	22	Bl	t (1) v (3) u, =t	
3	3543	90	Bh	u+2	
3	3543	,,	Wh	=t	
3	3543	...	Wb	t (2) v (3) 18, u (1) v (4) x	
3	3543	50	Ma	h (9) v (1) u, u+2·5	
3	3543	30	Co	u+1	
3	3543	44	Wi	=13	
4	3544	,,	,,	13+2, u+5	
5	3545	,,	,,	13+3	
5	3545	60	D	y+4	
5	3545	30	Bn	s (2) v (1) u	
7	3547	45	Br	q−5, u+2·5	
8	3548	90	Bh	u+3, y+10	
9	3549	...	Wb	q (2) v (3) x	
9	3549	50	Ma	h (9) v (1) u, u+4	
10	3550	,,	,,	h (7) v (1) u, u+4	
10	3550	30	D	u+1	
11	3551	45	Bh	n−7, u+8	
11	3551	30	Co	q−3, t+1	
12	3552	44	Wi	13+5	
12	3552	34	Li	n (8) v (2) 7	
13	3553	30	D	p−6, u+4	
16	3556	34	Li	k (6) v (4) m, l (4) v (6) m	
16	3556	44	Wi	q+2	
17	3557	30	Bn	o (3) v (1) q	
17	3557	50	Ma	h (4) v (1) u	
17	3557	...	Wb	p (2) v (3) u	
17	3557	90	Bh	n−3, u+10	
21	3561	,,	,,	=n	
24	3564	22	Bl	=m, =n	
25	3565	50	Ma	h (3) v (1) u	
25	3565	,,	Bn	o (1) v (2) q	

Feb. 5, Li, Orange red.
Mar. 6, 17, Wb, 3¾-in. OG.
Mar. 10, 18, 21, April 7, Wb, 2-in. OG.
Mar. 18, Ma, Reddish tinge.
Mar. 20, With 22, 9·9. Difficult.
April 8, Wb, 3¾-in. OG.

April 13, 14, Wb, 2-in. OG.
April 14, Ma, Deep red. Li, Reddish.
April 19, 26, Ma, Red.
May 9, Ma, Pale crimson.
May 16, Li, Reddish orange.
May 25, Ma, Deep pink crimson.

(3493) R LEONIS—*continued.*

1923 May					
27	3567	30	D	m−5, p+3	7·7
30	3570	34	Li	=l	6·9
30	3570	45	Bh	m+1	7·1
June					
2	3573	,,	,,	h−6, m+2	7·0
11	3582	,,	,,	f−10, h−5	6·9
11	3582	50	Bn	=n	7·5*b*
21	3592	45	Bh	f−8, h−4	6·7*b*
Sept					
7	3670	,,	,,	f+5, h+8	5·5
9	3672	,,	,,	f+4, h+8	5·5
11	3674	,,	,,	f+2, h+6	5·7
15	3678	,,	,,	f−3, h+2	6·2
25	3688	,,	,,	=h	6·4
Oct					
1	3694	,,	,,	=h, k+3	6·4
6	3699	,,	,,	h−4, k−2	6·8
14	3707	50	Bn	k (2) v (1) m	7·0
17	3710	30	D	m−1	7·3
17	3710	45	Bh	h−8, k−5	7·2
22	3715	22	Bl	k (7) v (1) m	7·2
23	3716	45	Bh	h−10, =n	7·5
25	3718	,,	,,	=n	7·5
26	3719	22	Bl	k (5) v (2) 5	7·1
Nov					
3	3727	45	Bh	m−5, n−2	7·7
6	3730	90	,,	n (1) v (3) u	7·8
6	3730	50	Bn	o (1) v (1) q	7·9
7	3731	22	Bl	n (5) v (1) q	8·1
9	3733	90	Bh	n (1) v (2) t, n−5, u+10	7·9
10	3734	22	Bl	n (5) v (2) q	8·0
16	3740	90	Bh	n (3) v (2) u	8·4
19	3743	45	,,	n (2) v (1) u	8·5
19	3743	50	Bn	q (3) v (1) s	8·5*b*
30	3754	45	Bh	n (3) v (1) u	8·6
Dec					
4	3758	90	Bh	u−1	9·1
9	3763	30	D	u−2, y+5	9·2
18	3772	90	Bh	u−3	9·3
20	3774	22	Bl	u (1) v (3) y	9·1
24	3778	90	Bh	u−3	9·3
24	3778	50	Bn	u (2) v (1) y	9·4
24	3778	60	D	=y	9·6*b*
28	3782	160	Br	u−5, y+2	9·5
1924 Jan					
2	3787	50	Ry	x−5, y−4, 25+4	10·1
2	3787	90	Bh	=y	9·6
2	3787	120	Bn	y (2) v (3) z	9·8
3	3788	90	Wh	=x	9·7
3	3788	50	Wb	=z	10·1
4	3789	60	D	u (2) v (1) z	9·7*b*
6	3791	50	Bn	y (2) v (3) z	9·8
6	3791	90	Bh	y−1	9·7
6	3791	22	Bl	x (4) v (1) a	10·3
6	3791	50	Wb	=z	10·1
6	3791	44	Wi	y−3, z−2	9·9
7	3792	60	D	z−1, a+4	10·1
11	3796	94	Bl	x (4) v (1) a	10·3
11	3796	45	Bh	y−1	9·7
15	3800	22	Bl	x (4) v (1) a	10·3
16	3801	90	Bh	u−8, y−2	9·8
20	3805	45	,,	u−10, y−2	9·9

Dec. 24, D, About.
Jan. 2, Ry, T. Wb used t until April 20.

1924 Jan					
26	3811	90	Bh	y−4	10·1
27	3812	50	Bn	y (4) v (1) z	10·0
27	3812	160	Br	y−6, a+3	10·2
27	3812	60	D	z−2, a+2	10·3
27	3812	30	Co	=a	10·5*b*
31	3816	90	Bh	y−5	10·1
Feb					
1	3817	30	Co	=a	10·5*b*
1	3817	22	Bl	a−3	10·8
1	3817	60	D	z−3, a+2	10·3
1	3817	50	Bn	y (3) v (1) z	10·0
4	3820	45	Bh	y−5	10·1*b*
8	3824	40	Hw	=a	10·5*b*
8	3824	60	D	z−3, a+2	10·3
11	3827	45	Bh	y−3	9·9
14	3830	90	,,	y−3	9·9
14	3830	50	Wb	=z	10·1*b*
14	3830	22	Bl	a−3	10·8
14	3830	60	D	z−3, a+1	10·4
16	3832	50	Bn	y (2) v (1) z	10·0
21	3837	90	Bh	u−5, y+1	9·5
22	3838	50	Bn	y (2) v (1) z	10·0*b*
22	3838	22	Bl	y (3·5) v (1·5) x	9·7
23	3839	40	D	z−2, a+3	10·2
24	3840	45	Br	y−1	9·7*b*
24	3840	90	Bh	y+1	9·5
25	3841	50	Ry	x−5, z+1	10·1*b*
25	3841	,,	Wb	x (2) v (3) 25	10·0
26	3842	90	Wh	=25	10·4
26	3842	,,	Bh	=y	9·6
28	3844	94	Bl	y (3) v (1) x, =x	9·7
28	3844	60	D	y−4, z+1	10·0
28	3844	30	Co	24+2	10·2*b*
28	3844	50	Ma	u (2) v (1) y	9·4
28	3844	40	Hw	=y	9·6*b*
Mar					
1	3846	45	Bh	y+2	9·4
2	3847	50	Bn	u (3) v (1) y	9·5
2	3847	,,	Wb	y (1) v (4) z	9·7
4	3849	,,	,,	x (1) v (4) z	9·8
4	3849	30	Co	y−3·5	10·0
4	3849	90	Bh	y+1	9·5
4	3849	40	D	y−4, z+2	10·0
5	3850	30	,,	y−3, z+2	9·9
5	3850	t	Kw	u (1) v (2) x, =19	9·3
5	3850	33	Wi	u−5, y+1	9·5
6	3851	22	Bl	u (5) v (1) y	9·5
7	3852	45	Bh	u−2	9·2
7	3852	50	Bn	u (5) v (2) y	9·5
8	3853	,,	Ma	u (1) v (1) y	9·3
8	3853	60	D	y−2, z+3	9·8
9	3854	45	Cn	y−2, x−2, z+3	9·8
9	3854	90	Bh	=u	9·0
9	3854	32	Ca	=z	10·1
9	3854	30	Co	y−4, =z	10·1*b*
9	3854	33	Wi	u−1, y+5	9·1
10	3855	,,	,,	u−2, y+4	9·2
10	3855	60	D	y−1, z+4	9·7
10	3855	90	Wh	y (1) v (2) 25	9·9
10	3855	50	Wb	=y	9·6
11	3856	,,	,,	y (2) v (3) z	9·8
11	3856	33	Wi	u−1, y+5	9·1

Jan. 27, Feb. 1, Co, Difficult.
Feb. 25, Ry, t. Wb, Red.
Feb. 28, Ma, Dull red.
Mar. 8, Ma, Pinky red.

(3493) R LEONIS—*continued.*

1924					
Mar					
11	3856	t	Kw	y+1, x−1	9·7
11	3856	90	Bh	u+1	8·9
11	3856	50	Ma	u+1	8·9
12	3857	22	Bl	u (4) v (2) y	9·4
13	3858	50	Bn	u (2) v (1) y	9·4
15	3860	90	Bh	u+1	8·9
19	3864	32	Ca	y (2) v (3) z	9·8
22	3867	90	Bh	u+1	8·9
22	3867	70	Wi	=u	9·0
24	3869	120	,,	u−5, =y	9·6
24	3869	30	Co	y−1, =x	9·7
24	3869	60	Kw	u (1) v (2) y, x+5	9·2
24	3869	40	Hw	=y	9·6
26	3871	32	Ca	w (2) v (3) y	9·3
26	3871	90	Bh	u+3	8·7
28	3873	30	Co	y+2, x+2	9·5
28	3873	40	Wb	=y	9·6*b*
29	3874	20	,,	=u	9·0
29	3874	22	Bl	=u	9·0
29	3874	79	Ma	u+2	8·8
30	3875	50	Bn	s (2) v (1) u	8·9
30	3875	60	D	u−5, y+1	9·5
30	3875	70	Wi	u−1, y+4	9·2
30	3875	60	Kw	=u, 13 (2) v (1) 18	9·3
Apr					
1	3877	70	Wi	u−1, y+4	9·2
1	3877	30	Co	y+2, x+2	9·5
1	3877	60	Kw	u+2, =13	8·9
1	3877	32	Ca	u (1) v (1) w	9·1
1	3877	25	Bn	q (2) v (1) s	8·5
2	3878	90	Bh	u+3	8·7
4	3880	30	Co	u−3	9·3
4	388c	45	Br	u+2	8·8
4	3880	25	Bn	q (2) v (1) s	8·5
5	3881	40	Hw	=y	9·6
5	3881	79	Ma	u+2, y+4	9·0
5	3881	60	Wb	=u	9·0
5	3881	70	Wi	u−1, y+5	9·1
6	3882	60	D	u−2, y+3	9·3
6	3882	90	Bh	u+5	8·5
6	3882	60	Kw	=u, 13−1	9·0
7	3883	,,	,,	u+1	8·9
7	3883	25	Bn	q (2) v (3) s	8·4
7	3883	50	Ma	u+2, y+3	9·1
7	3883	22	Bl	t (2·5) v (1·5) u	8·9
7	3883	30	Co	u−4, y+2	9·4
7	3883	120	Wi	u−2, y+3	9·3
8	3884	,,	,,	u−3, y+2	9·4
8	3884	32	Ca	=u	9·0
8	3884	90	Bh	u+4	8·6
9	3885	79	Ma	u+5, y+7	8·7*b*
9	3885	90	Wi	u−2, y+4	9·2
10	3886	60	D	u−1, y+5	9·1
11	3887	90	Bh	u+4	8·6
16	3892	45	,,	n (3) v (2) u	8·4
16	3892	32	Ca	t (1) v (1) u	8·9
17	3893	22	Bl	q (5) v (1) t, =t	8·8*b*

Mar. 11, Ma, Bronzy red.
Mar. 24, Kw, T. Very red, 8c.
Mar. 26, Bh, Orange.
Mar. 29, April 5, Ma, Red verging on crimson.
Mar. 30, Kw, T, Orange, 6c.
April 1 to 28, Kw, T.
April 1, Kw, 7c.
April 7, Ma, Red.
April 9, Ma, Deep red. Difficult.

1924					
Apr					
20	3896	144	Wi	u−1, y+4	9·2
20	3896	60	Wb	q (2) v (3) t	8·5
20	3896	,,	Kw	u+1, =13	8·9
20	3896	45	Bh	n (2) v (1) u	8·5
20	3896	25	Bn	o−4·5, q+1	8·1
23	3899	32	Ca	t (1) v (1) u	8·9
25	3901	30	Co	t−1, u+1	8·9
25	3901	45	Bh	n (3) v (2) u	8·4
27	3903	B	Cn	=u	9·0*b*
27	3903	50	Ma	h (7) v (1) u, u+5, y+7	8·7
27	3903	90	Wh	=u	9·0
27	3903	120	Wi	u+1	8·9
28	3904	80	,,	=u	9·0
28	3904	60	Kw	u+2, =13	8·9
30	3906	45	Bh	n (2) v (3) u	8·1
May					
1	3907	25	Bn	o (4) v (1) q	8·1
1	3907	32	Ca	=t	8·9
1	3907	79	Ma	h (3) v (1) u, u+6	8·4*b*
3	3909	45	Bh	n (2) v (3) u	8·1
4	3910	B	Cn	u+7	8·3*b*
4	3910	60	D	p (3) v (1) u, u+2	8·8
5	3911	90	Wi	u+3	8·7
5	3911	45	Bh	n (1) v (2) u	8·0
5	3911	79	Ma	h (3) v (2) u	8·0
7	3913	25	Bn	o (1) v (3) q	7·8
7	3913	30	D	p−6, u+4	8·6
7	3913	22	Bl	n (2) v (1) q, =q	8·0
8	3914	100	Wi	u+5	8·5
12	3918	32	Ca	l (1) v (1) m	7·1
13	3919	60	D	m−4, p+4	7·6
13	3919	22	Bl	k (1) v (6) m, =k	6·7*b*
13	3919	T	Co	m+2	7·0
13	3919	45	Bh	=m, n+2	7·3
16	3922	,,	,,	h (1) v (4) n, =k	6·6
16	3922	25	Bn	k (2) v (5) m	6·8
22	3928	45	Bh	f−5, =h	6·4
24	3930	22	Bl	f (5) v (1) h, =h	6·4*b*
25	3931	31	D	=k	6·6
25	3931	32	Ca	=h	6·4
25	3931	B	Cn	h−3, =k	6·7
25	3931	79	Ma	h−4	6·8
26	3932	45	Bh	f−4, h+2	6·2
27	3933	50	Ma	=h	6·4
27	3933	25	Bn	f−5, h+1	6·3
28	3934	30	Co	=h	6·4
29	3935	31	D	k+1	6·5*b*
30	3936	32	Ca	f (3) v (3) h	6·1
30	3936	B	Cn	h−2	6·6
31	3937	45	Bh	f−2, h+3	6·1
June					
1	3938	30	D	f−4, h+2	6·2
2	3939	50	Ma	h+2	6·2
3	3940	32	Ca	f (2) v (4) h	6·0
4	3941	45	Bh	=f, h+5	5·9*b*
5	3942	30	Co	h+1	6·3
8	3945	32	Ca	=f	5·8

April 20, Wb, Very red.
April 27, Ma, Bronzy red.
April 28, Kw, 7c.
May 5, Ma, Pale crimson.
May 25, 27, June 2, Ma, Pink with touch of purple.
May 28, June 5, Orange-red.
June 1, 7c, With B, 6·3.

(3493) R LEONIS—*continued.*

1924					
June					
11	3948	45	Bh	f+1	5·7*b*
13	3950	,,	,,	f+1	5·7*b*
14	3951	30	Co	h+2	6·2
22	3959	B	Cn	k+1	6·5
Sept					
5	4034	45	Bh	n (2) v (1) u	8·5*b*
16	4045	,,	,,	=u	9·0*b*
23	4052	,,	,,	u−2	9·2
29	4058	32	Ca	w (4) v (1) y	9·5
29	4058	45	Bh	u (1) v (2) y	9·2*b*
Oct					
2	4061	90	,,	u (1) v (1) y	9·3*b*
2	4061	37	Wb	=u	9·0
7	4066	50	,,	=y	9·6
9	4068	32	Ca	y (2) v (3) z	9·8
11	4070	94	Bl	u (1) v (4) y, =u	9·1*b*
11	4070	90	Bh	=y	9·6*b*
14	4073	,,	,,	u−7, y−1	9·7
23	4082	,,	,,	y−5	10·1
24	4083	32	Ca	z (2) v (1) a	10·3
31	4090	37	Wb	z (3) v (2) 25	10·3
31	4090	90	Bh	a+1	10·4*b*

June 14, Orange-red.

1924					
Nov					
2	4092	37	Wb	z (2) v (3) a	10·3
3	4093	50	Bn	z (2) v (1) a	10·3
3	4093	94	Bl	y (3) v (3) a, x−2	10·0
5	4095	90	Bh	a−1	10·6
9	4099	32	Ca	z (2) v (1) a	10·3
10	4100	45	Bh	=a	10·5*b*
15	4105	90	Bh	z (2) v (1) a	10·3
15	4105	94	Bl	y (5) v (1) a, =a	10·4*b*
24	4114	45	Bh	y (3) v (1) a	10·2*b*
27	4117	94	Bl	=a	10·5
Dec					
5	4125	37	Wb	a (3) v (2) 26	10·5
6	4126	60	D	y−6	10·2*b*
8	4128	,,	,,	z−2, a+2	10·3
21	4141	32	Ca	z (2) v (1) a	10·3
22	4142	60	D	z (1) v (1) a	10·3
22	4142	94	Bl	a−4	10·9
24	4144	37	Wb	z (3) v (2) a	10·3
25	4145	60	D	z (3) v (2) a	10·3
28	4148	37	Wb	=25	10·4
28	4148	50	Bn	z (3) v (1) a	10·4
30	4150	60	D	z (2) v (3) a	10·3

Dec. 6, About. Difficult.

(2478) R LYNCIS. (V. 1.)

H.D. 065355.

Star P = B.D. + 55° 1138, estimated by Nijland 7^{m}·7.

Date.	Julian Date.	Inst.	Observer.	Comparisons.	Deduced Mag.
1920					
Jan					
11	2335	94	Ni	31 (3) v (2) 44	11·7*b*
23	2347	,,	,,	20 (3) v (1·5) 28	10·5
Feb					
3	2358	,,	,,	16 (2) v (3) 20	9·9
14	2369	22	,,	12 (1) v (3) 16	9·5
19	2374	,,	,,	12 (2) v (2) 16	9·6
28	2383	,,	,,	12 (1·5) v (2·5) 16	9·5
Mar					
18	2402	,,	,,	6 (2) v (2) 12	9·1
Apr					
1	2416	,,	,,	6 (3) v (2) 12	9·2
16	2431	,,	,,	2 (2) v (1) 4	8·4
May					
9	2454	,,	,,	P+2·5, 2+4	7·5
21	2466	,,	,,	P (1) v (4) 2	7·8
June					
8	2484	,,	,,	2 (3) v (2) 4	8·4
July					
16	2522	,,	,,	12 (2) v (2) 16	9·6
29	2535	,,	,,	16 (3) v (2) 20	10·0*b*
Aug					
4	2541	94	,,	20 (2) v (3) 28	10·4
Sept					
9	2577	,,	,,	31 (1) v (3) 44	11·6
13	2581	75	Gi	=36	11·5*b*
16	2584	94	Ni	31 (2) v (3) 44	11·6

Date.	Julian Date.	Inst.	Observer.	Comparisons.	Deduced Mag.
1920					
Sept					
28	2596	75	Gi	40−1, 44+1	11·8*b*
Oct					
4	2602	94	Ni	44 (2) v (3) 50	12·1
10	2608	,,	,,	50 (1) v (4) r	12·6
18	2616	,,	,,	50 (5) v (1·5) r	12·7
23	2621	,,	,,	=r	12·8
28	2626	117	Gi	48−2	12·6*c*
Nov					
3	2632	160	Bo	59 (1) v (1) 60	12·8*b*
7	2636	,,	,,	60−2	13·0
14	2643	117	Gi	48−4	12·8*c*
16	2645	94	Ni	r (4) v (1) s	13·1
16	2645	160	Bo	60−4	13·2*b*
20	2649	,,	,,	r (1) v (1) s	13·0
Dec					
1	2660	94	Ni	s−3	13·4
12	2671	160	Bo	r (1) v (1) s	13·0*b*
24	2683	117	Gi	<50	<12·5
1921					
Jan					
7	2697	240	Br	50−10	13·5*b*
8	2698	160	Bo	r (3) v (1) s	13·0*b*
9	2699	83	Li	<50	<12·5

Jan. 7, About.

(2478) R LYNCIS—*continued.*

1921					
Jan					
9	2699	94	Ni	8−1	13·2
14	2704	160	Bo	1 (3) v (1) 8	13·0
16	2706	94	Ni	8−1	13·2
17	2707	117	Gi	48−5	12·9*b*
24	2714	90	Bh	60−1	12·9
27	2717	160	Bo	50 (1) v (3) 52	12·6
28	2718	117	Gi	48−2·5, 50−2	12·7
30	2720	90	Bh	50−1	12·6
31	2721	160	Bo	48 (3) v (1) 50	12·5
Feb					
2	2723	90	Bh	=50	12·5
5	2726	160	Bo	45 (3) v (1) 47	12·2
9	2730	90	Bh	50+2	12·3
13	2734	117	Gi	31−4, 44+2·5, 50+3·5	11·9*b*
14	2735	90	Bh	45−1, 47+1	12·2
16	2737	94	Ni	31 (3) v (2) 44	11·7
17	2738	120	Br	35−4, 44+4	11·5
18	2739	90	Bh	44−1, 47+3	12·0
19	2740	160	Bo	31 (1) v (3) 40	11·5
21	2742	90	Bh	=43	11·9
22	2743	94	Ni	31 (2) v (3) 44	11·6
24	2745	55	Bo	28 (3) v (1) 31	11·3
25	2746	90	Bh	28−8, 31−2	11·6
26	2747	117	Gi	28−3, 31+1·5	11·2
Mar					
2	2751	94	Ni	28 (1·5) v (4) 31	10·9
2	2751	55	Bo	=28	10·7
4	2753	96	Gr	=28	10·7
7	2756	90	Bh	28−4, 31+3	11·2
10	2759	,,	,,	28−2, 31+4	11·0
10	2759	160	Bo	21 (2) v (1) 28	10·6
12	2761	94	Ni	20 (4) v (1·5) 28	10·6
14	2763	117	Gi	28+1	10·6*b*
14	2763	90	Bh	=28	10·7
15	2764	55	Bo	22 (1) v (3) 28	10·5
15	2764	96	Gr	28−2	10·9
16	2765	90	Bh	=28	10·7
21	2770	,,	,,	21−2, 28+2	10·5
21	2770	160	Br	20−2, 22+2	10·3
21	2770	55	Bo	20 (1) v (2) 21	10·2
24	2773	90	Bh	20−2, =21	10·3
29	2778	,,	,,	20+1	10·0
29	2778	55	Bo	=20	10·1
29	2778	22	Ni	16 (1·5) v (0·5) 20	10·1
31	2780	117	Gi	=14, 20+3	9·8
Apr					
2	2782	55	Bo	15 (3) v (1) 16	9·8
4	2784	83	Li	=20	10·1*c*
7	2787	55	Bo	15 (1) v (3) 16	9·8
7	2787	90	Bh	=20	10·1
7	2787	83	Li	16−5, =20, 28+4	10·3
8	2788	22	Ni	=16, 20+3	9·8
11	2791	96	Gr	=22	10·4
12	2792	55	Bo	10 (1) v (3) 12	9·3
12	2792	90	Bh	=15, 20+4	9·7
15	2795	,,	,,	20+5	9·6
18	2798	55	Bo	9 (1) v (1) 10	9·2
22	2802	47	Gi	4−4, 6+1	8·9
23	2803	90	Bh	6−1	9·0
26	2806	45	,,	=5	8·8
27	2807	50	Gr	=6	8·9
28	2808	37	Li	2 (8) v (2) 4	8·5
28	2808	55	Bo	3 (3) v (1) 4	8·5
29	2809	45	Br	3−2, 4+2	8·4

Jan. 17, Difficult.

1921					
Apr					
29	2809	22	Ni	4 (3) v (3) 6	8·7
30	2810	90	Bh	=4	8·6
May					
1	2811	37	Li	2 (8) v (2) 5	8·6
5	2815	47	Gi	3−2·5, 4+4	8·3
7	2817	50	Gr	4+2	8·4
7	2817	90	Bh	=2, =3	8·1
9	2819	45	,,	=2, =3, 4+5	8·1
10	2820	55	Bo	c (3) v (2) 2	7·8
11	2821	22	Ni	2+1	7·9
16	2826	45	Bh	=2, =3	8·1
21	2831	55	Bo	c (2) v (1) 2	7·9*b*
23	2833	45	Bh	2+1, 3+2	7·9
23	2833	22	Ni	=P	7·7
25	2835	50	Gr	1−7, 3+7	7·4
29	2839	22	Ni	P+1	7·6
31	2841	47	Gi	=2	8·0*b*
June					
2	2843	90	Bh	2−1, 3+1	8·1*b*
4	2845	50	Gr	3+7	7·5
5	2846	90	Bh	=2, =3	8·1
5	2846	22	Ni	P−1, 2+3	7·8
10	2851	50	Gr	1−9, 3+5	7·6
11	2852	48	Wi	=2	8·0
15	2856	45	Bh	1−10, =2, 3+5	7·8
21	2862	,,	,,	=3, =4	8·4*b*
July					
2	2873	22	Ni	2 (3) v (2) 4	8·4*b*
8	2879	,,	,,	2 (5) v (1) 4	8·5
10	2881	,,	,,	4 (2) v (2) 6	8·7*b*
11	2882	45	Bh	3−4, 6+3	8·6*b*
23	2894	120	,,	=6	8·9
26	2897	45	,,	6−5, =12	9·4*b*
27	2898	75	Gi	4−3, 7+3	8·8
Aug					
6	2908	,,	,,	7−2, 12+3	9·1
15	2917	90	Bh	12−6, 19+3	9·9*b*
18	2920	94	Ni	12 (4) v (2) 16	9·7*b*
19	2921	90	Bh	19+1	10·0
25	2927	,,	,,	=20	10·1
30	2932	,,	,,	20−4, 21−1, 28+2	10·5
30	2932	94	Ni	20−0·5	10·2*b*
Sept					
2	2935	117	Gi	15−2·5, =20	10·1
5	2938	90	Bh	28−3, 31+3	11·1
6	2939	120	Br	=28	10·7
7	2940	160	Bo	28 (1) v (2) 31	11·0
16	2949	90	Bh	=31	11·5
24	2957	,,	,,	=31	11·5
24	2957	160	Bo	=31	11·5*c*
24	2957	94	Ni	28 (2·5) v (5) 31	11·0
25	2958	150	Bh	31−2	11·7
26	2959	120	,,	=31	11·5
27	2960	160	Bo	28 (4) v (3) 31	11·2
29	2962	94	Ni	28 (3) v (2) 31	11·2
30	2963	90	Bh	31−4, =44	11·9*b*
Oct					
1	2964	117	Gi	28−2·5, 44+5	11·2
1	2964	150	Wf	=31	11·5*b*
5	2968	83	Li	44 (5) v (5) 50	12·2
5	2968	48	Wi	44+2	11·7
6	2969	,,	,,	44−1	12·0
6	2969	160	Bo	31 (1) v (1) 44	11·7
6	2969	150	Wf	34−3, 40+2	11·5
6	2969	90	Bh	44−3, 48+3	12·2

Oct. 6, Wi, Difficult. Wf, 9-in.

(2478) R LYNCIS—*continued.*

1921 Oct					
8	2971	90	Bh	=48	12·4
9	2972	83	Li	<44	<11·9
9	2972	94	Ni	31 (1·5) v (4) 44	11·6
15	2978	90	Bh	48−1, 59+2	12·5
22	2985	157	Wf	44−3, 45+2	12·0
23	2986	90	Bh	59+1	12·7
27	2990	,,	,,	<50	<12·5
29	2992	160	Bo	44 (3) v (2) 48	12·2
29	2992	120	Br	44−2, 48+4	12·1
31	2994	90	Bh	59−1	12·9
Nov					
3	2997	117	Gi	=50	12·5*b*
6	3000	160	Bo	48 (1) v (1) 50	12·5
7	3001	90	Bh	59−5	13·3
7	3001	120	Br	=50	12·5
10	3004	94	Ni	50 (4) v (3) r	12·7
17	3011	90	Bh	59−5	13·3*b*
19	3013	140	Bo	48 (1) v (1) 50	12·5*c*
22	3016	,,	,,	r (1) v (3) s	12·9*b*
22	3016	94	Ni	r+0·5	12·8
23	3017	120	Bh	50−8, 56−5	13·3
24	3018	275	Bo	s (1) v (1) t	13·3*b*
29	3023	117	Gi	48−3	12·7*b*
29	2023	150	Bh	<60	<12·8
30	3024	94	Ni	r (3) v (4) s	12·9
Dec					
3	3027	83	Li	<50	<12·5
3	3027	90	Bh	<60	<12·8
4	3028	94	Ni	r (4) v (3) s	13·0
15	3039	231	Wf	<56	<12·7*c*
18	3042	140	Bo	s (1) v (1) t	13·3*c*
20	3044	120	Bh	Estimated	<13·0
25	3049	94	Ni	Estimated	<13·2
26	3050	160	Bo	<s	<13·1
26	3050	120	Bh	Estimated	<13·5
28	3052	117	Gi	<48	<12·4*b*
29	3053	94	Ni	s−2	13·3
30	3054	231	Wf	<t	<13·5
1922 Jan					
4	3059	83	Li	<40	<11·7*b*
10	3065	231	Wf	<60	<12·8*b*
17	3072	150	,,	u−2	14·0
18	3073	90	Bh	<59	<12·8
20	3075	48	Wi	<50	<12·5
20	3075	90	Bh	<60	<12·8
21	3076	117	Gi	<48	<12·4
23	3078	150	Wf	t−1, u+2	13·6*b*
Feb					
4	3090	157	,,	r (1) v (1) s	13·0
4	3090	94	Ni	=r	12·8
5	3091	90	Bh	59−3	13·1
10	3096	,,	,,	50−2, =59	12·8
17	3103	,,	,,	44−4, 50+1	12·4
1922 Feb					
17	3103	...	Sa	35−15	12·7
19	3105	150	Wf	44 (1) v (1) 45	12·0
20	3106	152	Li	=50	12·5
20	3106	90	Bh	31−2, 44+2	11·7
20	3106	70	Gr	=44	11·9
21	3107	...	Sa	35−12	12·4
25	3111	94	Ni	31 (2) v (2) 44	11·7
25	3111	117	Gi	31 (2) v (2) 41	11·6
26	3112	160	Br	28−5, 31+2	11·3
26	3112	150	Bh	28−2	10·9
28	3114	62	Wf	34 (1) v (1) 40	11·5
Mar					
4	3118	90	Bh	20−4, 28+2	10·5
5	3119	62	Wf	=34	11·3
8	3122	...	Sa	28−5, 35+2	11·1
16	3130	90	Bh	28+2	10·5
16	3130	70	Gr	=28	10·7
17	3131	117	Gi	22 (3) v (1·5) 28, 24+2	10·5
19	3133	150	Wf	20−4, 28+2	10·5*b*
20	3134	94	Ni	15 (4) v (2) 28	10·4
22	3136	90	Bh	20−4, 28+2	10·5
26	3140	62	Wf	=22	10·4
28	3142	90	Bh	20−4, 28+2	10·5
29	3143	94	Ni	15 (3) v (3) 28	10·2
31	3145	90	Bh	20−4, 28+2	10·5
Apr					
4	3149	,,	,,	20−3, 28+3	10·4
4	3149	...	Sa	15−10, 20−3, 28+3, 35+10	10·4
4	3149	62	Wf	20−1, 22+2	10·2
9	3154	94	Ni	=20	10·1
13	3158	70	Gr	=28	10·7
13	3158	117	Gi	15 (4) v (1) 20	10·1
14	3159	90	Bh	20−1	10·2
17	3162	,,	,,	20−1	10·2
18	3163	,,	,,	=20	10·1
19	3164	62	Wf	=19	10·1
19	3164	90	Wi	22−2, 28+1	10·6
20	3165	33	,,	20−2, 28+5	10·3
20	3165	22	Ni	12 (6) v (1) 20	10·0
21	3166	33	Wi	22−1, 28+2	10·5*b*
23	3168	90	Bh	=20	10·1
24	3169	33	Wi	20−2, 28+4	10·3
29	3174	62	Wf	12−1, 13+1	9·5
29	3174	...	Sa	7−5, 12−4, =15, 20+3	9·7
29	3174	90	Bh	=20	10·1
May					
2	3177	,,	,,	20+3	9·8
3	3178	70	Gr	=14	9·8*b*
4	3179	90	Wi	20+3	9·8
6	3181	,,	Bh	20+5	9·6
8	3183	45	,,	=7	9·0
8	3183	117	Gi	6 (2) v (3·5) 12, =7	9·0
10	3185	70	Gr	6−2	9·1
12	3187	45	Bh	3−5, 6+2, 8+5	8·7
12	3187	62	Wf	4−2, 6+3	8·7
13	3188	...	Sa	4−3, =7, 12+4, 15+7	9·0
16	3191	70	Gr	=7	9·0

Oct. 27, Dec. 25, Not seen.
Nov. 7, Br, About.
Nov. 29, Dec. 3, 20, 26, Jan. 18, 20, Bh, Not seen.
Dec. 15, Invisible. Dew on eyepiece.
Dec. 28, Just glimpsed.
Dec. 30, Barely suspected. Estimated as <14·2.
Jan. 10, Invisible.
Jan. 20, Wi, Not seen.
Jan. 21, Glimpsed.
Jan. 23, Very difficult.

Mar. 19, Reddish.
Mar. 26, Tinge of red.
April 29, Wf, Reddish.
May 8, Gi, 5^c.

(2478) R LYNCIS—*continued.*

1922 May					
17	3192	45	Bh	5+2, 6+3	8·6
19	3194	62	Wf	3−3, 4+5	8·3*b*
19	3194	33	Wi	3+1, 7+4	8·3
19	3194	47	Gi	3 (2·5) v (1·5) 4	8·4
21	3196	70	Gr	7−1	9·1
21	3196	45	Bh	3−3, 5+3	8·5
23	3198	22	Ni	2 (4) v (1) 4	8·5
24	3199	70	Gr	=6	8·9
26	3201	45	Bh	3−2, 5+4	8·4
27	3202	,,	,,	=2, =3	8·1
27	3202	...	Sa	1−12, 2−3, 4+4, 7+8	8·2
28	3203	22	Ni	2 (2) v (2) 4	8·3
28	3203	33	Wi	3+3	7·9
30	3205	62	Wf	2−1·5, 3+0·5	8·1*c*
31	3206	70	Gr	3+4	7·8
June					
1	3207	75	Gi	2 (2) v (2) 3	8·1
4	3210	90	Bh	6+5, 7+10	8·2*b*
5	3211	70	Gr	3+4	7·8
10	3216	62	Wf	1−7·5, 2+4	7·5
15	3221	90	Bh	1−8·5, 2+4·5	7·6*b*
18	3224	62	Wf	2+2, 3+3	7·8*b*
23	3229	75	Gi	1 (7) v (4) 3, 2+2·5	7·7
26	3232	45	Bh	1−10, 2+3	7·7
29	3235	...	Sa	1−6, 2+5, 4+12	7·4
July					
2	3238	62	Wf	1 (6) v (5) 3, 2+3	7·6*b*
3	3239	75	Gi	2 (1) v (4·5) 3	8·0
10	3246	45	Bh	=2	8·0*b*
12	3248	22	Ni	2 (2·5) v (2·5) 4	8·3
19	3255	117	Gi	=3, 4+2·5	8·3
20	3256	45	Bh	=2, =3	8·1*b*
21	3257	,,	Br	3+2	8·0*b*
27	3263	,,	Bh	=4, 6+4	8·5
Aug					
5	3272	90	,,	=6	8·9*b*
9	3276	117	Gi	4 (4) v (3) 7	8·8
15	3282	94	Ni	=4	9·4
16	3283	62	Wf	7−2, 12+2	9·2
17	3284	90	Bh	=7	9·0
20	3287	,,	,,	7−1, 12+2	9·1
23	3290	62	Wf	=12, 20+6	9·4
25	3292	90	Bh	=12	9·4
29	3296	94	Ni	12 (2) v (4) 20	9·6
29	3296	117	Gi	12 (1·5) v (2·5) 14	9·5
31	3298	45	Bh	12−2	9·6
Sept					
9	3307	...	Sa	12−12, 15−3, =20 =24, 28+3	10·3
10	3308	90	Bh	7−8, =16, 21+5	9·8
12	3310	94	Ni	16 (1) v (2) 20	9·9
13	3311	44	Wi	=20, 28+3	10·3
14	3312	150	Wf	=20	10·1
18	3316	90	Bh	=20	10·1
20	3318	117	Gi	14 (3) v (1·5) 18	9·9
22	3320	90	Bh	20−1, 22+2	10·2
23	3321	150	Wf	=23	10·5
29	3327	160	Br	28−3	11·0
30	3328	45	Bh	20−3, 28+3	10·4*b*
Oct					
4	3332	90	,,	28−1	10·8
1922 Oct.					
7	3335	94	Ni	28 (4) v (3) 31	11·2
11	3339	90	Bh	28−5, 44+5	11·3
12	3340	94	Li	34 (5) v (5) 37	11·4
13	3341	90	Bh	44+3	11·6
13	3341	150	Wf	34−2, 37+2	11·4
14	3342	...	Sa	20−10, 28−6, 35−4	11·3
15	3343	94	Ni	28 (4) v (2) 31	11·2
15	3343	,,	Li	34 (5) v (5) 37	11·4
18	3346	,,	,,	34 (6) v (4) 37	11·5
18	3346	90	Bh	44+1	11·8
21	3349	,,	,,	=44	11·9
24	3352	94	Ni	31 (1) v (3) 44	11·6
25	3353	90	Bh	44−1	12·0
27	3355	94	Li	37 (5) v (5) 40	11·6
Nov					
1	3360	90	Bh	44−3, 47+1	12·2
9	3368	,,	,,	44−5, =47	12·3
15	3374	94	Ni	50 (2) v (5) 1	12·6
16	3375	70	Gr	=50	12·5
19	3378	90	Bh	47−1, 50+1	12·4
21	3380	117	Gi	50−1, =52	12·6*b*
24	3383	120	Br	50−2, =52	12·7
24	3383	150	Bh	44−9, 50−2	12·8
26	3385	94	Ni	50 (6) v (2) 1	12·7
Dec					
1	3390	150	Bh	50−3, 52−1	12·8
6	3395	,,	,,	47−6, 56−3	13·0
11	3400	90	,,	50−6, 56−3	13·1
11	3400	94	Li	<52	<12·6*b*
16	3405	90	Bh	56−3	13·0
17	3406	94	Ni	1 (3) v (3) s	13·0
18	3407	90	Bh	44−10, 50−6	13·0
20	3409	120	Wi	<60	<12·8
25	3414	90	Bh	<56	<12·7
26	3415	120	Wi	<60	<12·8
1923 Jan					
4	3424	90	Bh	<60	<12·8
6	3426	193	Li	<52	<12·6
8	3428	120	Wi	<60	<12·8
8	3428	,,	Bh	60−10, =t	13·6*b*
9	3429	94	Ni	s−2	13·3*b*
16	3436	,,	,,	=s	13·1
17	3437	117	Gi	s (1) v (1) t	13·3*b*
20	3440	150	Bh	<60	<12·8
20	3440	193	Li	<60	<12·8
23	3443	157	Wf	t−2, u+1	13·7
27	3447	150	Bh	60−6	13·4*b*
Feb					
3	3454	120	,,	60−8, =t	13·5
6	3457	94	Ni	1 (4) v (1) s	13·1
7	3458	120	Br	Estimated	13·5
7	3458	157	Wf	t+1	13·4
8	3459	60	Bh	60−8, =t	13·5
17	3468	94	Ni	1+1	12·7
23	3474	150	Bh	50−1	12·6
25	3476	90	,,	=47, 50+2	12·3
Mar					
5	3484	,,	,,	=44	11·9*b*

May 19, Wf, Orange red.
June 23, July 3, 6[e].
July 19, 4[e].
Aug. 29, Ni. With 22, 9·9.

Oct. 15, 18, 27, Li, Difficult.
Dec. 20, 26, Invisible.
Dec. 25, Not seen.
Jan. 4, 20, Bh, Not seen.
Jan. 23, Difficult.
Jan. 27, Glimpsed.
Feb. 7, Br, Glimpsed. Much <50.

(2478) R LYNCIS—*continued.*

1923 Mar					
5	3484	94	Li	40 (5) v (5) 44	11·8*b*
5	3484	...	Sa	=41	11·8
13	3492	90	Bh	28−7, 44+4	11·5
15	3494	117	Gi	28 (3) v (1·5) 31	11·2
17	3496	94	Ni	31 (4) v (3) 44	11·7
17	3496	90	Bh	28−5, 44+6	11·3
17	3496	...	Sa	=31	11·5
18	3497	94	Li	=30	11·0
21	3500	90	Bh	28−1, 44+10	10·9
25	3504	,,	,,	28−3	11·0
25	3504	193	Li	28 (3) v (7) 31	11·0
27	3506	90	Bh	28−3, 31+4	11·1
27	3506	94	Ni	28 (4) v (4) 31	11·1
28	3507	117	Gi	28 (1·5) v (3·5) 31	11·0
Apr					
1	3511	90	Bh	28−2	10·9
4	3514	94	Ni	=28	10·7
6	3516	150	Wf	=28	10·7
7	3517	117	Gi	28 (1·5) v (5·5) 31	10·9*b*
9	3519	90	Bh	20−5, 28+1	10·6
10	3520	150	Wf	20−3, 28+2	10·5
10	3520	94	Ni	20 (6) v (1) 28	10·6
12	3522	...	Gr	=22	10·4
13	3523	90	Bh	20−3, 28+3	10·4
14	3524	120	Wi	20−3, 28+3	10·4
14	3524	193	Li	=20	10·1
14	3524	...	Sa	=28	10·7
15	3525	150	Wf	=28	10·7
17	3527	90	Bh	=20, =28	10·4*b*
19	3529	94	Li	22 (3) v (7) 28	10·5
20	3530	,,	Ni	20 (3) v (3) 28	10·4
20	3530	90	Bh	20−3, 28+3	10·4*b*
22	3532	,,	,,	20−3, 28+3	10·4
23	3533	...	Sa	=28	10·7
25	3535	117	Gi	20 (1) v (1·5) 21	10·2
27	3537	90	Bh	20−2, 28+4	10·3
May					
1	3541	,,	,,	20−2, 28+4	10·3*b*
3	3543	,,	,,	20+2, 28+6	10·0*b*
3	3543	34	Li	14 (5) v (5) 18	9·9
3	3543	...	Sa	=20	10·1
6	3546	62	Wf	12−3, 16+3	9·6
6	3546	...	Gr	14−2	10·0
10	3550	22	Ni	6 (4) v (1·5) 12	9·2
11	3551	90	Bh	20+3, 21+6	9·8
12	3552	...	Sa	6−7, 7−8, 20+3, 28+5	9·9
16	3556	34	Li	4 (7) v (3) 7	8·9
17	3557	90	Bh	6−3, 20+10	9·2
19	3559	117	Gi	6 (2) v (1) 7	9·0
20	3560	62	Wf	3−5, 6+3, 7+4	8·6
23	3563	34	Li	2 (5) v (5) 4	8·3
23	3563	...	Sa	3−5, 4−3, 6+2, 7+3	8·7
24	3564	22	Ni	6−1	9·0
30	3570	34	Li	1 (7) v (3) 2	7·6
30	3570	90	Bh	1−10, 4+10	7·6*b*
June					
2	3573	45	,,	1−8, 4+12	7·4
2	3573	...	Gr	3+2	8·0
2	3573	34	Li	1 (6) v (4) 2	7·5
11	3582	,,	,,	1 (2) v (8) 2, b (2) v (8) 2, =c	7·2
11	3582	...	Sa	1−6, 3+9	7·3*b*

Mar. 5, Li, Difficult.
May 19, 5^c.

1923 June					
11	3582	45	Bh	1−2	6·9
18	3589	...	Sa	1−3, 3+10	7·1*b*
21	3592	45	Bh	1−3, 2+10	7·0*b*
24	3595	,,	,,	1−3, 2+10	7·0*b*
28	3599	62	Wf	b−2·5, 2+6·5	7·4*b*
July					
5	3606	45	Bh	1−3	7·0
6	3607	47	Gi	1 (6) v (5) 2	7·4*b*
6	3607	22	Ni	=2	8·0*b*
8	3609	62	Wf	b−5, 2+3	7·7*b*
8	3609	45	Bh	1−3	7·0
11	3612	22	Ni	P (4) v (2) 2	7·9
18	3619	...	Sa	1−15, 4+10	7·9*b*
19	3620	62	Wf	2−3, 4+1	8·4
20	3621	45	Bh	1−3, 2+10	7·0*b*
26	3627	...	Sa	2−3, =3, 4+4, 5+7	8·2
30	3631	45	Bh	1−7, 3+5	7·5*b*
Aug					
3	3635	,,	,,	2−2, =3, 4+4, 5+6	8·2
3	3635	22	Ni	=4	8·6
6	3638	62	Wf	3−3, 6+5	8·4
8	3640	45	Bh	4−2, 6+2	8·7
11	3643	...	Sa	4−6, 6−2, 13+6	9·1
12	3644	62	Wf	6+2, 7+3·5	8·7
15	3647	90	Bh	6+1	8·8
22	3654	,,	,,	=6, =7	9·0
28	3660	,,	,,	6−2, =7	9·1
28	3660	...	Sa	6−1, 7+1	9·0
30	3662	...	,,	6−6, 7−4, 11+4, 13+2, 17+3	9·4
Sept					
2	3665	90	Bh	7−5, 12−1	9·5
3	3666	94	Ni	12 (3) v (4) 15	9·5
5	3668	150	Wf	=14, 20+4	9·8
7	3670	90	Bh	20+3, 22+6	9·8
8	3671	160	Br	=22	10·4
9	3672	90	Bh	20+2, 22+4, 28+8	10·0
13	3676	62	Wf	16−1, 20+2	9·9
15	3678	...	Sa	13−4, 17+1, =21	10·1
15	3678	90	Bh	20+1, 22+3	10·1
21	3684	,,	,,	20−1, 22+1	10·3
26	3689	,,	,,	=22	10·4
29	3692	...	Sa	=28	10·7
Oct					
1	3694	160	Br	=28	10·7
1	3694	150	Wf	20−5, 28+1	10·6
1	3694	90	Bh	=22	10·4
4	3697	,,	,,	20−3, =22, 28+3	10·4
7	3700	,,	,,	=22, =23	10·5
9	3702	94	Ni	20 (4) v (1) 28	10·6
9	3702	150	Wf	28−1, 30+1	10·9
11	3704	...	Sa	28−4, =30	11·1
11	3704	90	Bh	20−4, 28+2	10·5
17	3710	,,	,,	=28	10·7
21	3714	120	Wi	28−4, 31+4	11·1
23	3716	,,	,,	28−7, 31+2	11·4
23	3716	90	Bh	22−4, 25−2, 31+6	10·9
30	3723	150	Wf	28−6·5, =31	11·4
Nov					
1	3725	90	Bh	28−3	11·0*b*
3	3727	,,	,,	31+2, 40+5	11·2
3	3727	,,	Si	=41	11·8

July 6, Gi, 6^c.

(2478) R LYNCIS—*continued.*

1923 Nov					
4	3728	OG	Ph	=41, 50+4	11·9
7	3731	...	Sa	=40	11·7
7	3731	90	Bh	28−5, =34, 31+1	11·3
8	3732	94	Ni	28−7, 31−1, 44+3	11·5
11	3735	90	Bh	28−6, 44+4	11·4
15	3739	94	Ni	31 (2) v (2) 44	11·7
17	3741	90	Bh	28−8, 44+2	11·6
23	3747	,,	,,	22−10, 28−8	11·5*b*
24	3748	...	Sa	=45	12·1
29	3753	90	Bh	28−10, =44	11·8
30	3754	150	Si	=50	12·5
Dec					
2	3756	90	Bh	=44, 47+3	11·9
5	3759	150	,,	44−1, 47+2	12·0
8	3762	...	Sa	=48	12·4
9	3763	OG	Ph	48+2, =50, 52+1	12·4
9	3763	150	Bh	44−5, 47−1	12·4
11	3765	94	Ni	50 (4) v (4) 1	12·7
12	3766	157	Wf	50−1, =52	12·6
14	3768	...	Sa	=50	12·5
18	3772	90	Bh	44−6, 47−3	12·5
19	3773	...	Sa	<50	<12·5
24	3778	90	Bh	44−6, 50−1	12·6
28	3782	,,	,,	=50	12·5
28	3782	...	Sa	<50	<12·5
31	3785	90	Bh	50−1	12·6*b*
1924 Jan					
3	3788	134	Sa	<50	<12·5
4	3789	94	Ni	1 (3) v (3) s	13·0
5	3790	90	Bh	50−5, 60−3	13·1
6	3791	120	Br	50−6, 60−3	13·1*b*
6	3791	OG	Ph	47−4, 48−3	12·7
11	3796	90	Bh	59−5, 60−5	13·3
15	3800	94	Ni	1 (4) v (4) s	13·0
20	3805	120	Bh	60−5	13·3
24	3809	,,	Br	60−5	13·3
25	3810	150	Bh	50−5, 60−1	13·0*b*
27	3812	94	Ni	s−1	13·2*b*
29	3814	150	Si	<55	<12·7
Feb					
8	3824	94	Ni	1 (4) v (1·5) s	13·0
8	3824	157	Wf	t−2	13·7
11	3827	120	Bh	50−10, 60−5	13·4
18	3834	,,	,,	59−7, 60−5	13·4
24	3840	90	,,	52−6, 56−4	13·2
26	3842	,,	,,	50−6, 52−5	13·1
28	3844	94	Ni	1 (3) v (3) s	13·0
28	3844	90	Bh	50−5, 60−1	13·0
Mar					
2	3847	120	Si	<60	<12·8
4	3849	90	Wh	=60	12·8
4	3849	150	Bh	50−3, 52−3	12·9
7	3852	90	,,	50−3	12·8
7	3852	94	Ni	1+2	12·6
8	3853	120	Si	=57	12·7
9	3854	OG	Ph	=50	12·5
10	3855	100	Si	=57	12·7
10	3855	90	Bh	50−5, 56−3	13·0
15	3860	,,	,,	=50	12·5
16	3861	94	Ni	31 (3) v (2) 44	11·7
19	3864	90	Bh	44−3, =47, 50+3	12·2
1924 Mar					
20	3865	134	Sa	31−2, 44+2	11·7
22	3867	90	Bh	28 (4) v (1) 44, 28 (1) v (1) 47	11·6*b*
24	3869	120	Wi	28−2, 31+5	10·9
26	3871	90	Bh	20 (3) v (1) 28, 40+8	10·7
29	3874	,,	,,	28+1	10·6
30	3875	70	Wi	22+2, 28+5	10·2
Apr					
1	3877	44	,,	28+5	10·2
1	3877	100	Si	=20	10·1
2	3878	94	Ni	=20	10·1
2	3878	90	Bh	20−3, 28+2	10·5
4	3880	,,	,,	28+1	10·6
4	3880	,,	Si	=20	10·1*b*
6	3882	,,	Bh	22−1	10·5
7	3883	34	Sa	17−2, =20, 21+4	10·1
7	3883	90	Si	14 (2) v (3) 20	9·9
7	3883	62	Wf	=20	10·1
7	3883	44	Wi	12−6, 20+2	9·9
7	3883	OG	Ph	20 (1) v (1) 28, =21	10·4
8	3884	90	Bh	=22	10·4
11	3887	,,	,,	20 (1) v (1) 22, =21	10·3
14	3890	34	Sa	7−4, =9, 11+2, 13+6	9·2
20	3896	90	Bh	=6, =7	9·0*b*
23	3899	62	Wf	7−1, 12+4	9·0
25	3901	90	Bh	7 (1) v (2) 12, =8	9·1
26	3902	34	Sa	6−2, 7+1	9·0
27	3903	90	Si	=7	9·0
27	3903	44	Wi	7−1, 12+3	9·1
29	3905	62	Wf	6+2, 7+3	8·7
30	3906	45	Bh	=5, 6+1, 7+2	8·8
May					
3	3909	90	,,	5−1, =6	8·9*b*
5	3911	45	,,	4+1, 6+3	8·5
5	3911	34	Sa	4−2, 5−3, 6+1, 7+4	8·8
5	3911	62	Wf	4−1, 6+2	8·7
5	3911	M	Ph	6+2·5	8·6*b*
5	3911	22	Ni	2 (7) v (1·5) 4	8·5
10	3916	90	Si	=7	9·0
11	3917	34	Sa	2−6, 3−4, 4+2, 5+1, 6+3	8·6
11	3917	62	Wf	3−1, 6+6	8·3
13	3919	90	Bh	3−4, =4, 5+2	8·6
16	3922	45	,,	=2, 4+4	8·1
16	3922	34	Sa	2−3, 3+1, 5+4	8·3
16	3922	22	Ni	2 (3) v (1) 4	8·5
22	3928	45	Bh	2+4	7·6
23	3929	62	Wf	2 (1) v (1) 4	8·3
26	3932	22	Ni	2 (4) v (3) 4	8·4
27	3933	45	Bh	1 (3) v (1) 2, 1 (1) v (1) 4	7·7
27	3933	100	Si	2 (2) v (3) 4	8·3*b*
29	3935	62	Wf	2 (1) v (1) 4	8·3
June					
4	3941	45	Bh	1 (2) v (1) 2	7·6*b*
7	3944	62	Wf	2−2, 4+3	8·3
13	3950	45	Bh	1 (2) v (1) 2	7·6*b*
17	3954	,,	,,	1 (1) v (1) 2	7·4*b*
18	3955	34	Sa	1−5, 2+7, 3+10	7·2*b*
19	3956	45	Bh	1+1	6·6*b*
22	3959	62	Wf	2+1	7·9*b*

Nov. 4, Second estimate half weight.
Dec. 19, 28, Sa, Not visible.
Jan. 3, Not visible.
Jan. 24, About.
Jan. 27, Difficult.

April 20, Yellow.
June 19, Orange.

(2478) R LYNCIS—*continued.*

1924					
June					
24	3961	45	Bh	1 (1) v (4) 2	7·0
27	3964	62	Wf	c−2, 2+2	7·8*b*
27	3964	34	Sa	1−7, 2+7, 3+10	7·3
30	3967	45	Bh	1 (1) v (3) 2	7·0
July					
3	3970	62	Wf	2 (2) v (1) 4	8·4*b*
8	3975	,,	,,	1−8, 3+7	7·5*b*
10	3977	22	Ni	2+2	7·8*b*
11	3978	45	Bh	1 (1) v (1) 2	7·4
14	3981	,,	,,	1 (2) v (1) 2	7·6
19	3986	,,	,,	1 (3) v (1) 2	7·7*b*
22	3989	62	Wf	2−5, 4+2	8·5
26	3993	22	Ni	2 (3) v (3) 4	8·3
26	3993	45	Bh	2−2	8·2
27	3994	62	Wf	=4	8·6
Aug					
3	4001	45	Bh	=4	8·6
4	4002	62	Wf	=4	8·6
8	4006	90	Bh	5 (1) v (2) 12, 6 (1) v (1) 7	9·0
20	4018	45	,,	6 (1) v (1) 7	9·0
22	4020	100	Si	=5	8·8
25	4023	45	Bh	6 (1) v (2) 7	8·9
25	4023	62	Wf	5+1, 7+3	8·7
31	4029	,,	,,	6−3, 12+1	9·2
Sept					
3	4032	90	Bh	4 (1) v (1) 12, 6 (1) v (1) 7	9·0
5	4034	,,	,,	7 (2) v (1) 12	9·2
8	4037	34	Sa	7−4, =11, 13+2, 17+4, 20+4	9·5
12	4041	90	Bh	12−1	9·5
16	4045	,,	,,	12 (1) v (1) 20, 12 (1) v (2) 27	9·8
17	4046	64	Sa	13−3, 20+2	10·0
23	4052	45	Bh	20+2	9·9*b*
27	4056	64	Sa	=20	10·1
27	4056	100	Si	=18	10·0
27	4056	62	Wf	=20, 28+5	10·2
29	4058	150	Bh	=20	10·1
Oct					
2	4061	90	,,	=20	10·1
4	4063	44	Li	15 (7) v (3) 20	10·0
5	4064	62	Wf	20−3, 28+3	10·4
6	4065	134	Sa	=20	10·1

July 10, Difficult.

1924					
Oct					
8	4067	90	Bh	20 (1) v (1) 23	10·3
11	4070	,,	,,	20 (1) v (1) 22	10·3
15	4074	,,	,,	20 (2) v (1) 23	10·4
19	4078	100	Si	14 (3) v (2) 24	10·2
22	4081	,,	,,	14 (3) v (2) 24	10·2
23	4082	90	Bh	=23	10·5
23	4082	94	Ni	20 (1·5) v (7) 28	10·2
23	4082	34	Li	20 (2) v (8) 28	10·3
23	4082	160	Br	20−2, 28+4	10·3
27	4086	90	Bh	23 (1) v (1) 28	10·6
28	4087	100	Si	=35	11·2
31	4090	90	Bh	=28	10·7
Nov					
1	4091	,,	Sa	28−6, 31+2	11·3*b*
3	4093	,,	,,	28−6, 31+2	11·3
3	4093	,,	Bh	28 (1) v (2) 31	11·0
3	4093	44	Li	=28	10·7
4	4094	94	Ni	28+1	10·6
6	4096	90	Bh	28 (1) v (1) 31	11·1
15	4105	,,	,,	31−1, =41	11·7
17	4107	,,	Si	=41	11·8
23	4113	94	Ni	31 (2·5) v (2·5) 44	11·7
24	4114	90	Bh	=41	11·8
27	4117	,,	,,	31−4, 41−2	11·9
30	4120	94	Li	44 (3) v (7) 50	12·1
30	4120	90	Si	=50	12·5*b*
Dec					
1	4121	,,	Bh	=44	11·9
5	4125	,,	,,	44+1	11·8
13	4133	134	Sa	44−2	12·1
14	4134	90	Bh	44+1	11·8
14	4134	193	Li	=47	12·3*b*
19	4139	90	Bh	50+1, 52+2	12·4
19	4139	,,	Si	<52	<12·6
22	4142	,,	,,	<52	<12·6
23	4143	94	Ni	50 (3) v (2) 1	12·7
24	4144	90	Bh	50−1	12·6
26	4146	,,	,,	50−2	12·7
26	4146	,,	Si	=60	12·8
27	4147	,,	Sa	=50	12·5
30	4150	,,	Si	=60	12·8
30	4150	94	Ni	50 (4) v (1) 1	12·7
30	4150	M	Ph	=48, 60+3·5	12·4
30	4150	90	Bh	44 (3) v (1) 50	12·4

Oct. 23, Ni, Unsteady. Dec. 13, Difficult.
Dec. 14, Li, 26, 30, Si, Difficult.

(6549) W LYRÆ. (V. 6.)

H.D. 181136.

Date.	Julian Date.	Inst.	Observer.	Comparisons.	Deduced Mag.
1920 Jan					
1	2325	90	Bh	c−1, d+3	9·1
1	2325	,,	Wh	d−1	9·5
5	2329	45	Bh	c−4, d+1	9·3*b*
8	2332	90	,,	=d	9·4
13	2337	,,	,,	d−2	9·6*b*
14	2338	48	Bg	=e	9·8*c*
15	2339	90	Wh	=g	10·1
15	2339	45	Bh	e−2, g+1	10·0*b*
21	2345	,,	,,	=g	10·1
24	2348	150	,,	g−2	10·3
24	2348	62	Th	g−4	10·5*b*
24	2348	90	Wh	d (3) v (1) e	9·7*b*
Feb					
5	2360	,,	Bh	g−10, o+10	11·2
10	2365	45	,,	k−5, o+8	11·5
15	2370	90	,,	o+5	11·8
17	2372	60	D	n−4, o+2	12·1*b*
18	2373	55	Bg	m−5, p+6	11·7*b*
18	2373	90	Bh	o+3	12·0
23	2378	,,	,,	o+2	12·1
29	2384	,,	,,	=o, =q	12·3
Mar					
4	2388	,,	,,	=o, =q	12·3
7	2391	,,	,,	o+1, q+2	12·2
8	2392	157	Th	o+5	11·8*b*
12	2396	55	Bg	m−2, p+9	11·4
12	2396	90	Bh	o+3	12·0
16	2400	,,	,,	m−4, o+7	11·6
16	2400	62	Th	m−2	11·4*b*
18	2402	90	Bh	g−10, m+1	11·1
21	2405	,,	,,	g−4, m+7	10·5
22	2406	,,	Wh	=k	10·9
23	2407	60	D	k−2, =l	11·0
25	2409	90	Bh	e−2, g+1	10·0
31	2415	,,	,,	c−9, =e, g+3	9·8
Apr					
11	2426	45	,,	=d	9·4
12	2427	90	,,	d+1	9·3
13	2428	30	D	c−4, d+1	9·3
17	2432	90	Bh	=c	8·9
17	2432	,,	Wh	=b	8·3
21	2436	30	D	c−3, d+3	9·2
21	2436	55	Bg	b−2, c+4	8·5
21	2436	90	Bh	b−4, c+2	8·7
23	2438	30	D	b−5, c+1	8·8
25	2440	50	Tm	=c	8·9
27	2442	45	Bh	=b	8·3
29	2444	50	Tm	b+1	8·2
29	2444	62	Th	=b	8·3*b*
29	2444	90	Wh	b+3	8·0
May					
2	2447	55	Bg	a−3, b+2	8·1*b*
2	2447	50	Tm	b+3	8·0
4	2449	,,	,,	=b	8·3
1920 May					
4	2449	45	Bh	b+2	8·1
7	2452	90	,,	a+1, b+6	7·7
7	2452	30	D	a−3, b+2	8·1
7	2452	50	Tm	b+4	7·9
9	2454	,,	,,	b+1	8·2*b*
9	2454	90	Wh	b+3	8·0
9	2454	62	Th	b+1	8·2
9	2454	30	D	a−3, b+2	8·1
10	2455	55	Bg	a−3, b+2	8·1
10	2455	50	Tm	b+2	8·1
12	2457	,,	,,	b+5	7·8*b*
12	2457	30	D	a−3, b+2	8·1
13	2458	90	Bh	a+2	7·6
14	2459	50	Tm	b+2	8·1*b*
16	2461	30	D	a−2, b+3	8·0*b*
17	2462	90	Bh	a+2	7·6
18	2463	55	Bg	=a	7·8*b*
18	2463	30	D	a−2, b+3	8·0
19	2464	50	Tm	b+1	8·2
21	2466	45	Bh	a+2	7·6
21	2466	50	Bn	a+1·5	7·6
21	2466	30	D	a−0·5, b+4	7·9*b*
22	2467	50	Th	b+2	8·1
22	2467	90	Wh	b (1) v (1) c	8·6
22	2467	50	Tm	b+1	8·2*b*
23	2468	,,	,,	b+2	8·1*b*
23	2468	45	Bh	a+2	7·6
25	2470	30	D	a−2	8·0*b*
26	2471	55	Bg	a−3, b+2	8·1
29	2474	50	Bn	a+1	7·7
29	2474	90	Bh	=a, b+5	7·8
29	2474	50	Tm	b+2	8·1*b*
June					
1	2477	55	Bg	a−4, b+1	8·2
2	2478	45	Bh	a−2, b+3	8·0*b*
4	2480	90	,,	=a, b+5	7·8
4	2480	50	Tm	b+1	8·2*b*
4	2480	90	Wh	b (1) v (1) e, =b	8·8
5	2481	50	Bn	a (2) v (1) b	8·1
6	2482	64	Ad	a (4) v (1) b	8·2
8	2484	50	Bn	a−3, b+2	8·1
8	2484	45	Bh	a−1, b+4	7·9
8	2484	30	D	b−2, c+4	8·5
9	2485	55	Bg	a−3, b+2	8·1
10	2486	30	D	b−2, c+4	8·5
12	2488	,,	,,	b−2, c+3	8·6*b*
14	2490	50	Tm	b−1	8·4
15	2491	30	D	b−3, c+3	8·6
15	2491	45	Bh	=b	8·3
18	2494	,,	,,	b−1	8·4
19	2495	64	Ad	c (1) v (2) d	9·1*b*
19	2495	55	Bg	b−4, c+2	8·7
19	2495	30	D	b−4, c+2	8·7
22	2498	,,	,,	=c	8·9*b*
23	2499	55	Bg	c−2, d+3	9·1

Jan. 14, About.
Feb. 17, Difficult.

May 22, Th, With 12¼-in. mirror at Headley.

(6549) W LYRÆ—*continued.*

1920 June					
23	2499	45	Bh	b−1	8·4
23	2499	50	Tm	c (1) v (9) e, =c	9·0
23	2499	64	Ad	c (1) v (3) d	9·0*b*
29	2505	90	Bh	b−3, c+3	8·6
July					
3	2509	55	Bg	c−4, d+1	9·3*b*
7	2513	90	Bh	b−5, d+6	8·8
8	2514	55	Bg	d−1, e+3	9·5*b*
8	2514	30	D	c−4, d+2	9·3*b*
10	2516	90	Bh	d+4	9·0
12	2518	30	D	d−1, e+3	9·5
13	2519	55	Bg	d−3, e+1	9·7
15	2521	50	Bn	c (5) v (1) d	9·4
15	2521	90	Bh	c−3, d+2	9·2
16	2522	30	D	d−3, e+1	9·7
18	2524	90	Wh	g (1) v (1) h	10·3
22	2528	60	D	=e	9·8*b*
24	2530	90	Bh	d−4, g+3	9·8
26	2532	,,	,,	d−6, g+1	10·0
28	2534	55	Bg	g−3, h+1	10·4*b*
30	2536	90	Bh	e−3, =g	10·1
31	2537	55	Bg	=h	10·5*b*
Aug					
6	2543	90	Bh	k+2	10·7
8	2545	,,	,,	k−1	11·0
8	2545	,,	Wh	o (2) v (1) n	11·9
9	2546	75	Bn	=k	10·9*b*
13	2550	90	Bh	k−3	11·2
15	2552	55	Bg	k−2, m+1	11·1
19	2556	90	Bh	k−4	11·3
26	2563	,,	,,	o+5	11·8
26	2563	75	Bg	m−3	11·5*b*
29	2566	90	Bh	k−6, o+6	11·6*b*
Sept					
4	2572	,,	,,	o+2	12·1
5	2573	50	Tm	<q	<12·4
8	2576	90	Wh	o+3	12·0
10	2578	150	Ad	=q	12·4*b*
13	2581	90	Bh	o+2	12·1
18	2586	75	Bg	o−2	12·5
19	2587	90	Wh	=q	12·4
19	2587	,,	Bh	o+1, q+2	12·2
26	2594	,,	,,	o+2	12·1*b*
29	2597	,,	,,	o+2, q+1	12·2
29	2597	75	Bg	m−8, o+3	12·0*b*
Oct					
1	2599	90	Bh	o+2, q+3	12·1
2	2600	50	Tm	=n	11·7
6	2604	,,	,,	m (1) v (1) n	11·5*b*
6	2604	90	Bh	l−8, o+3	11·9
9	2607	45	,,	k−6, m+3	11·5
9	2607	64	Ad	k (1) v (3) m	11·0*b*
9	2607	60	D	k−2	11·1*b*
9	2607	50	Tm	m (1) v (1) n	11·5*b*
11	2609	,,	,,	e (1) v (1) m	10·5
11	2609	120	Bn	g (3) v (1) h	10·4
11	2609	55	Bg	h−2, k+2	10·7*b*
12	2610	45	Bh	e−2, g+1	10·0
12	2610	...	Gr	=m	11·2
13	2611	...	,,	m+1	11·1
15	2613	...	,,	=l	11·0
17	2615	90	Bh	e+1, g+4	9·7
18	2616	,,	,,	d−3, e+1	9·7
1920 Oct					
19	2617	55	Bg	d−3, e+1	9·7
21	2619	...	Gr	=f	10·0
22	2620	...	,,	=e	9·8
22	2620	90	Bh	c−4, d+1	9·3
24	2622	,,	,,	d+2	9·2
24	2622	64	Ad	c (3) v (1) d	9·3
24	2622	60	D	d−3, e+2	9·7
25	2623	...	Gr	=e	9·8
25	2623	120	Bn	d+1	9·3
26	2624	64	Ad	c (1) v (1) d	9·2
26	2624	55	Bg	c−3, d+2	9·2
28	2626	...	Gr	d−1	9·5
29	2627	45	Bh	=d	9·4
30	2628	75	Bg	c−2, d+3	9·1
Nov					
1	2630	30	D	c−4, d+1	9·3
1	2630	90	Bh	c−1, d+4	9·0
2	2631	50	Bn	c (1) v (1) d	9·2
3	2632	45	Bh	b−5, c+1	8·8
5	2634	...	Gr	=c	8·9
8	2637	...	,,	=c	8·9
9	2638	90	Bh	b−2, c+4	8·5
10	2639	...	Gr	c+2	8·7
12	2641	90	Bh	b−3, c+3	8·6
12	2641	...	Gr	b−3, c+3	8·6
13	2642	90	Bh	b−2, c+4	8·5
14	2643	...	Gr	b−1	8·4
16	2645	...	,,	b+1	8·2
16	2645	55	Bg	b−3, c+3	8·6
16	2645	90	Bh	b−1	8·4
17	2646	50	Bn	a (4) v (1) b	8·2
17	2646	30	D	b−2·5, c+4	8·5
18	2647	...	Gr	=b	8·3*b*
19	2648	55	Bg	b−2, c+4	8·5
21	2650	50	Bn	a−3, b+2	8·1
21	2650	64	Ad	b (1) v (1) c	8·6
21	2650	...	Gr	=b	8·3*b*
22	2651	45	Bh	b+1	8·2
25	2654	...	Gr	b+3	8·0
30	2659	90	Bh	a−2, b+3	8·0
Dec					
1	2660	55	Bg	a−1, b+4	7·9
1	2660	50	Bn	a+1·5	7·6
1	2660	,,	Tm	b+1	8·2
5	2664	90	Bh	b+3	8·0
8	2667	,,	,,	a−2, b+3	8·0
9	2668	50	Bn	a+1·5	7·6
11	2670	90	Bh	b+1	8·2
14	2673	50	Tm	=b	8·3
17	2676	90	Bh	b−1, c+5	8·4
21	2680	,,	,,	b−1	8·4
22	2681	48	Bg	b−2, c+4	8·5
25	2684	45	Bh	b−2, c+4	8·5
28	2687	48	Bg	b−3, c+3	8·6*b*
28	2687	30	Bn	a (3) v (1) b	8·2
31	2690	90	Bh	b−5, c+1	8·8
1921 Jan					
6	2696	,,	,,	=c	8·9
7	2697	45	,,	b−5, c+1	8·8
10	2700	90	,,	=c	8·9
12	2702	75	Bn	c (2) v (3) d	9·1
13	2703	90	Bh	=c	8·9
30	2720	,,	,,	=g	10·1
Feb					
2	2723	,,	,,	=g	10·1
9	2730	,,	,,	g−1	10·2
17	2738	,,	,,	g−8, m+3	10·9

Sept. 10, Very difficult.
Sept. 29, Bg, o difficult
Oct. 9, D, Difficult.

(6549) W LYRÆ—*continued.*

1921					
Feb					
21	2742	90	Bh	m−3	11·5*b*
25	2746	,,	,,	m−5, o+6	11·7
Mar					
2	2751	45	,,	o+2	12·1
6	2755	90	,,	o−1	12·4
16	2765	,,	,,	o+1	12·2
24	2773	,,	,,	o+1	12·2*b*
29	2778	,,	,,	=o, =q	12·3
30	2779	75	Bg	m−9, o+2	12·1*b*
Apr					
1	2781	90	Bh	o+2	12·1
7	2787	,,	,,	o+1, q+2	12·2
7	2787	60	D	<n	<11·7
8	2788	150	Wf	n−4, o+1	12·2*c*
8	2788	90	Bh	o+3, q+4	12·0
13	2793	,,	,,	n−3	12·0
15	2795	45	,,	n−2	11·9
19	2799	90	,,	n−1, o+5	11·8
23	2803	,,	,,	g−8, n+8	10·9
24	2804	...	Wf	g (1) v (1) k	10·5*b*
26	2806	90	Bh	g−1	10·2
28	2808	,,	,,	e−2, g+1	10·0
28	2808	60	D	d−3, e+1	9·7
28	2808	55	Bg	d−4, =e	9·8
29	2809	120	Bn	=g	10·1
May					
5	2815	...	Wf	b−7, e+3	9·3*b*
7	2817	90	Bh	=e	9·8
8	2818	55	Bg	c−2, d+3	9·1
8	2818	50	Gr	=d	9·4
8	2818	...	Wf	c−3, g+7	9·3
9	2819	50	Bn	c (2) v (1) d	9·3
9	2819	90	Bh	d−1, e+3	9·5
14	2824	55	Bg	c−1, d+4	9·0
15	2825	90	Bh	b−4, c+2	8·7
16	2826	30	D	c−3, d+2	9·2
19	2829	55	Bg	b−5, c+1	8·8
19	2829	50	Bn	b (4) v (1) c	8·8
22	2832	30	D	c−2·5, d+3	9·2*b*
24	2834	55	Bg	b−3, c+3	8·6
24	2834	90	Bh	b−1, c+4	8·5
24	2834	62	Wf	=b	8·3
27	2837	50	Gr	c+2	8·7
28	2838	30	D	b−3, c+2	8·7
31	2841	,,	,,	b−3, c+3	8·6*b*
June					
1	2842	55	Bg	b−2, c+4	8·5
2	2843	90	Bh	b+1	8·2
2	2843	62	Wf	=b	8·3
4	2845	50	Gr	c+2	8·7
5	2846	90	Bh	b+2	8·1
5	2846	30	D	b−2, c+3	8·6
6	2847	48	Bg	=b	8·3
6	2847	50	Bn	b−0·5	8·4
6	2847	48	Wi	b−4, c+2	8·7
7	2848	30	D	b−1, c+4	8·5*b*
7	2848	25	Ad	a (2) v (1) b	8·1
9	2850	48	Wi	b−5, c+1	8·8
9	2850	62	Wf	=b	8·3
10	2851	50	Gr	b−5	8·8
10	2851	90	Bh	b+3	8·0
11	2852	25	Ad	a (2) v (1) b	8·1
11	2852	55	Bg	a−4, b+1	8·2
11	2852	50	Bn	a (4) v (1) b	8·2
1921					
June					
11	2852	48	Wi	b−1, c+5	8·4
12	2853	45	Bh	b+1	8·2
15	2856	90	,,	b+1	8·2
15	2856	55	Bg	=a	7·8
16	2857	30	D	a−3, b+1	8·1*b*
22	2863	50	Gr	=b	8·3
22	2863	55	Bg	a−1, b+4	7·9
23	2864	25	Ad	a (1) v (2) b	8·0*b*
23	2864	50	Bn	=a	7·8
24	2865	,,	Gr	b+3	8·0
24	2865	90	Bh	a−2, b+3	8·0
24	2865	30	D	a−2, b+3	8·0*b*
25	2866	,,	,,	a−1, b+4	7·9
26	2867	62	Wf	a+1	7·7
27	2868	90	Bh	a−2, b+3	8·0
27	2868	55	Bg	=a	7·8*b*
27	2868	30	D	a−2, b+3	8·0
28	2869	,,	,,	a+0·5	7·7
28	2869	50	Gr	b+3	8·0
28	2869	,,	Bn	a+2	7·6
30	2871	,,	Gr	b+3	8·0
July					
2	2873	55	Bg	a−2, b+3	8·0*b*
2	2873	90	Bh	a−2, b+3	8·0
4	2875	30	D	a+2	7·6
4	2875	50	Gr	=b	8·3*b*
5	2876	30	Bn	a−3, b+2	8·1
7	2878	55	Bg	=a	7·8
7	2878	90	Bh	=a, b+5	7·8
7	2878	30	D	a−3, b+2	8·1*b*
8	2879	,,	,,	a−3, b+3	8·0
9	2880	48	Wi	b−3, d+8	8·6
9	2880	62	Wf	=a	7·8
9	2880	50	Gr	b+2	8·1
11	2882	30	D	=b	8·3
11	2882	90	Bh	a+2	7·6
12	2883	50	Bn	a (1) v (1) b	8·0
13	2884	,,	Gr	b+3	8·0
14	2885	62	Wf	a−3, b+2	8·1
18	2889	90	Bh	a+2, b+7	7·6
19	2890	50	Gr	b−1	8·4
19	2890	30	D	b−2	8·5*b*
21	2892	,,	,,	b−3, c+2	8·7*b*
21	2892	55	Bg	a−3, b+2	8·1
23	2894	62	Wf	=c	8·9
24	2895	50	Gr	c−1	9·0
25	2896	25	Ad	c (3) v (1) d	9·3
25	2896	30	D	b−3, c+1	8·7
26	2897	,,	,,	=c	8·9
26	2897	50	Bn	c (2) v (3) d	9·1
26	2897	45	Bh	=a, b+5	7·8
29	2900	50	Gr	d+2	9·2
30	2901	62	Wf	c−4, d+1	9·3
30	2901	30	D	c−2, d+3	9·1
31	2902	55	Bg	c−1, d+4	9·0
31	2902	25	Ad	=d	9·4
Aug					
1	2903	30	D	c−3, d+2	9·2
3	2905	,,	,,	c−4, d+2	9·3
4	2906	50	Gr	e+2	9·6
6	2908	62	Wf	c−3, e+2	9·4
6	2908	45	Bh	b−1	8·4*b*
6	2908	55	Bg	c−3, d+2	9·2
6	2908	30	D	c−4, d+1	9·3*b*

Mar. 30, About.
June 2, Wf, Both stars red.

July 9, 14, 23, 30, Aug. 6, Wf, 3-in.
July 19, D, Difficult.

(6549) W LYRÆ—*continued.*

1921 Aug					
8	2910	30	D	=d	9·4*b*
8	2910	64	Ad	d (3) v (1) g	9·9
9	2911	50	Gr	e+1	9·7
10	2912	60	D	d−2, e+3	9·6*b*
11	2913	50	Gr	e+1	9·7
15	2917	90	Bh	d+1	9·3
18	2920	64	Ad	e (1) v (1) g	9·9*b*
18	2920	55	Bg	d−3, e+1	9·7
19	2921	90	Bh	d−5, g+2	9·9
21	2923	50	Gr	g−2	10·3
23	2925	60	D	=f	10·0*b*
25	2927	50	Gr	k+2	10·7
25	2927	62	Wf	g−3, h+1	10·4
25	2927	90	Bh	g−3	10·4
26	2928	60	D	g−6, k+2	10·7
29	2931	96	Gr	=k	10·9
29	2931	45	Bh	g−5	10·6
30	3932	90	,,	g−4	10·5
30	2932	60	D	k−1	11·0
Sept					
1	2934	,,	,,	h−3, k+1	10·8
4	2937	90	Bh	m−2	11·4
5	2938	,,	,,	m−4	11·6
5	2938	75	Bn	h (2) v (1) k	10·8
5	2938	96	Gr	=k	10·9
6	2939	60	D	k−3, m+1	11·2
7	2940	55	Bg	h−3, k+1	10·8
7	2940	64	Ad	=h	10·5
8	2941	,,	,,	=k	10·9*b*
8	2941	75	Bn	k−1	11·0
9	2942	62	Wf	=l	11·0
12	2945	64	Ad	m−2	11·4*b*
15	2948	,,	,,	n−1	11·8*b*
21	2954	75	Bg	m−5, o+6	11·7
21	2954	120	Bn	n−1	11·8*b*
21	2954	150	Bh	o+4	11·9
22	2955	82	Ad	=o	12·3*b*
23	2956	62	Wf	n−3, o+2	12·1
24	2957	120	Bn	n (2) v (3) o	11·9
24	2957	90	Bh	o+5	11·8
25	2958	75	Bg	m−6, o+5	11·8
26	2959	96	Gr	n−1	11·8
28	2961	45	Bh	o+5	11·8
29	2962	150	Bn	n (1) v (2) o	11·9
29	2962	75	Bg	m−8, o+3	12·0
30	2963	90	Bh	o+4	11·9
Oct					
1	2964	64	Ad	n−1	11·8*b*
3	2966	62	Wf	m−1	11·3*b*
4	2967	120	Bn	n (1) v (1) o	12·0
4	2967	82	Ad	n−1	11·8
5	2968	96	Gr	=n	11·7*b*
5	2968	90	Bh	o+4	11·9
6	2969	,,	,,	o+4	11·9
6	2969	75	Bg	k−3, =m	11·2
6	2969	120	Bn	n−3, o+3	12·0
8	2971	,,	,,	n−3, o+3	12·0
9	2972	64	Ad	e (7) v (1) l	10·8*b*
15	2978	90	Bh	o+4	11·9
16	2979	50	Bn	m (2) v (1) n	11·5*b*
17	2980	90	Bh	k−6, o+7	11·5
1921 Oct					
18	2981	96	Gr	=h	10·5
20	2983	,,	,,	h+2	10·3
21	2984	62	Wf	f−2, h+3	10·2
23	2986	120	Bn	h−3, k+2	10·8
23	2986	90	Bh	=k	10·9
27	2990	,,	,,	k+3	10·6
28	2991	120	Bn	g−3, h+2	10·4
28	2991	65	Bg	e−1, g+2	9·9*b*
30	2993	96	Gr	h+2	10·3
31	2994	90	Bh	e−4, g−1	10·2
Nov					
2	2996	62	Wf	=f	10·0
6	3000	90	Bh	d−3, e+1	9·7
6	3000	120	Bn	g (1) v (1) h	10·3
8	3002	150	Wf	g−1, h+4	10·2*b*
10	3004	120	Bn	e−1, g+2	9·9
12	3006	45	Bh	=c	8·9
17	3011	50	Gr	=c	8·9
22	3016	55	Bg	=d	9·4*b*
22	3016	90	Bh	c−2, d+3	9·1
23	3017	50	Bn	d−2, e+2	9·6
26	3020	64	Ad	c (1) v (1) d	9·2*b*
26	3020	45	Bh	c−4, d+1	9·3
29	3023	55	Bg	c−3, d+2	9·2
30	3024	50	Gr	e+5	9·3
Dec					
3	3027	90	Bh	=c	8·9
4	3028	,,	,,	b−5, c+1	8·8
7	3031	55	Bg	c−2, d+3	9·1*b*
13	3037	62	Wf	b−1, c+9	8·2
13	3037	45	Bh	b−2, c+4	8·5
15	3039	90	,,	b−1	8·4
17	3041	64	Ad	b (4) v (1) c	8·8
17	3041	48	Bg	b−4, c+2	8·7
17	3041	,,	Wi	b−2, c+4	8·5
20	3044	50	Bn	=b	8·3*b*
23	3047	90	Bh	=b	8·3
25	3049	,,	,,	b−1	8·4
26	3050	45	,,	=b	8·3
27	3051	50	Gr	b−4	8·7
28	3052	90	Bh	b−2, c+4	8·5
28	3052	75	Bn	b+1	8·2
29	3053	48	Bg	b−2, c+4	8·5*b*
30	3054	90	Bh	b−3, c+3	8·6
31	3055	75	Bn	b+1	8·2
1922 Jan					
3	3058	90	Bh	b−4, c+2	8·7
8	3063	,,	,,	b−5, c+1	8·8
9	3064	62	Wf	a−3, b+2	8·1*b*
10	3065	48	Bg	a−3, b+2	8·1*b*
10	3065	75	Bn	a−4, b+1	8·2
16	3071	,,	,,	a−4, b+1	8·2
17	3072	62	Wf	a−3, b+2	8·1
18	3073	90	Bh	b−4, c+2	8·7
20	3075	,,	,,	b+0·5, c+7	8·2
23	3078	62	Wf	a−3, b+2	8·1
24	3079	90	Bh	b−1, c+5	8·4
Feb					
19	3105	62	Wf	c−3, d+2	9·2
25	3111	30	D	=d	9·4*b*
28	3114	62	Wf	=e	9·8
Mar					
4	3118	90	Bh	d−5	9·9

Aug. 23, About.
Aug. 25, Wf, 3-in.
Sept. 9, Oct. 3, 6-in.
Sept. 22, o very difficult.
Sept. 23, 9-in.

Oct. 21, 9-in.
Jan. 23, Reddish.

(6549) W LYRÆ—*continued.*

1922					
Mar					
5	3119	62	Wf	d−2, e+3	9·6
15	3129	90	Bh	g−3	10·4
19	3133	,,	,,	g−8	10·9
19	3133	62	Wf	g−2, h+1	10·4
26	3140	,,	,,	h−3, k+1	10·8
28	3142	150	Bh	o+5	11·8
Apr					
4	3149	90	,,	o+2	12·1
4	3149	62	Wf	n−4, o+2	12·1
9	3154	90	Bh	=o, =p	12·3*b*
14	3159	,,	,,	<o	<12·3*b*
17	3162	,,	,,	o+1, p+2	12·2
19	3164	75	Bg	=o	12·3*b*
19	3164	150	Wf	=o	12·3
23	3168	90	Bh	Estimated	<12·0*b*
29	3174	,,	,,	o+1	12·2
29	3174	150	Wf	=o	12·3
May					
2	3177	120	Bn	o+1	12·2
2	3177	90	Bh	o+1	12·2
3	3178	70	Gr	k−10	11·9*b*
4	3179	75	Bg	m−8, o+3	12·0*b*
5	3180	90	Bh	o−1	12·4
6	3181	120	Wi	n−1, o+4	11·9
8	3183	90	Bh	=o, =p	12·3
12	3187	,,	,,	o+3	12·0*b*
12	3187	120	Wi	k−6, o+7	11·5
13	3188	,,	,,	k−10	11·9*b*
14	3189	,,	,,	k−6, o+10	11·4
14	3189	150	Wf	n−4, o+2	12·1
14	3189	55	Bg	m−4, o+7	11·6
15	3190	120	Bn	n−4·5, o+1·5	12·2
16	3191	70	Gr	o+3	12·0
17	3192	90	Bh	o+4	11·9
17	3192	120	Wi	k−8	11·7
19	3194	,,	,,	k−4	11·3
20	3195	55	Bg	m−1, o+10	11·3*b*
21	3196	50	Bn	k (1) v (2) m	11·0
21	3196	62	D	k+1	10·8*b*
21	3196	70	Gr	k−5	11·4
21	3196	150	Wf	k−2, m+1	11·1
23	3198	50	Bn	h (2) v (1) k	10·8
24	3199	70	Gr	k−2	11·1
26	3201	90	Bh	g−3	10·4
27	3202	,,	,,	=g	10·1
27	3202	120	Bn	g (1) v (1) h	10·3
27	3202	64	Ad	=h	10·5
28	3203	55	Bg	e−3, =g	10·1
29	3204	62	Wf	g−1, h+4	10·2
31	3206	90	Bh	d−6, g+1	10·0*b*
June					
1	3207	50	Bn	=d	9·4
4	3210	,,	,,	c (3) v (1) d	9·3
4	3210	90	Bh	d−5, g+2	9·9
5	3211	70	Gr	=e	9·8
6	3212	64	Ad	=d	9·4*b*
7	3213	55	Bg	c−2, d+3	9·1
11	3217	64	Ad	d (4) v (1) g	9·9
11	3217	62	Wf	c−2, d+3	9·1
12	3218	55	Bg	c−2, d+3	9·1
12	3218	90	Bh	c−3, d+2	9·2
15	3221	,,	,,	=c	8·9
16	3222	70	Gr	=d	9·4
1922					
June					
19	3225	55	Bg	b−4, c+2	8·7
22	3228	90	Bh	b−4, c+1	8·8
23	3229	55	Bg	=c	8·9*b*
23	3229	70	Gr	=d	9·4
24	3230	62	Wf	=c	8·9
26	3232	45	Bh	=c	8·9
27	3233	70	Gr	=c	8·9
29	3235	45	Bh	b−5, c+1	8·8*b*
July					
1	3237	70	Gr	c+1	8·8
2	3238	62	Wf	b−4, c+3	8·7
3	3239	55	Bg	=c	8·9*b*
9	3245	70	Gr	b−3	8·6
10	3246	45	Bh	b+1	8·2
14	3250	90	,,	b+1	8·2
16	3252	70	Gr	b+2	8·1
19	3255	55	Bg	a−2, b+3	8·0
20	3256	25	Ad	a (4) v (1) b	8·2
20	3256	50	Bn	a (2) v (3) b	8·0
20	3256	45	Bh	b+2	8·1*b*
20	3256	70	Gr	b+5	7·8
23	3259	62	Wf	b+2	8·1*b*
23	3259	45	Bh	b+2	8·1
24	3260	55	Bg	a−2, b+3	8·0
24	3260	25	Ad	a (3) v (1) b	8·2
25	3261	70	Gr	b+3	8·0
27	3263	45	Bh	b+2	8·1
30	3266	70	Gr	b+2	8·1
30	3266	62	Wf	b+2	8·1
31	3267	25	Ad	a (4) v (1) b	8·2
31	3267	55	Bg	a+2	7·6
Aug					
5	3272	45	Bh	b+1	8·2
7	3274	25	Ad	a (2) v (1) b	8·1
7	3274	30	Bg	a+1	7·7
9	3276	70	Gr	b+1	8·2
11	3278	45	Bh	b+2	8·1
13	3280	62	Wf	b+1	8·2*b*
15	3282	70	Gr	b+3	8·0*b*
15	3282	75	D	b+1	8·2*b*
15	3282	,,	Bn	=b	8·3*b*
15	3282	25	Ad	=b	8·3
16	3283	55	Bg	=a	7·8
17	3284	150	Wf	b+2	8·1
17	3284	90	Bh	=b	8·3
20	3287	,,	,,	b−2, c+4	8·5
20	3287	55	Bg	a−3, b+2	8·1
20	3287	25	Ad	b (4) v (1) c	8·8
20	3287	70	Gr	b+3	8·0
21	3288	62	Wf	b−1, c+4	8·5
23	3290	25	Ad	b (1) v (1) c	8·6*b*
23	3290	55	Bg	a−4, b+1	8·2
23	3290	90	Bh	b−3, c+3	8·6
25	3292	,,	,,	b−2, c+4	8·5
26	3293	25	Ad	c (1) v (2) d	9·1
26	3293	62	Wf	b−4, c+2	8·7
31	3298	90	Bh	b−4, c+2	8·7
31	3298	55	Bg	c−1, d+4	9·0
Sept					
3	3301	64	Ad	c (3) v (1) d	9·3*b*
5	3303	,,	,,	=d	9·4*b*
7	3305	62	Wf	c−4, d+1	9·3
7	3305	90	Bh	c−1	9·0*b*

April 14, 23, Not seen.
April 19, Bg, About.
June 6, Troublesome.

Aug. 15, D, 3-in.
Aug. 21, Reddish.
Aug. 23, Ad, Eye tired.

(6549) W LYRÆ—*continued.*

1922 Sept					
8	3306	70	Gr	=d	9·4
11	3309	64	Ad	d (2) v (3) g	9·9
11	3309	62	Wf	d−2, e+2	9·6
11	3309	44	Wi	e+2	9·6
13	3311	120	,,	e+3	9·5
14	3312	150	Wf	g−2, k+6	10·3
15	3313	90	Bh	d−3	9·7
16	3314	62	Wf	g−1, h+3	10·2
16	3314	70	Gr	g−2	10·3
19	3317	62	Wf	g−3, h+2	10·4
20	3318	70	Gr	h+2	10·3
20	3318	50	Bn	g (3) v (1) h	10·4
20	3318	55	Bg	g−1, h+3	10·2
21	3319	90	Bh	c−10, d−5	9·9
23	3321	62	Wf	=h, l+4	10·6
24	3322	55	Bg	g−3, h+1	10·4*b*
24	3322	64	Ad	g (1) v (4) k	10·2
26	3324	90	Bh	g−1	10·2
29	3327	70	Gr	=h	10·5
29	3327	55	Bg	h−2, k+2	10·7
30	3328	90	Bh	g−4	10·5*b*
Oct					
5	3333	62	Wf	=m	11·2
6	3334	90	Bh	g−8	10·9
6	3334	120	Bn	n−1	11·8
11	3339	55	Bg	m−2, o+9	11·4
12	3340	70	Gr	k−5	11·4*b*
13	3341	64	Ad	m (2) v (1) n	11·5*b*
13	3341	120	Bn	n (2) v (1) q	12·1
13	3341	90	Bh	o+5	11·8
14	3342	,,	,,	o+4	11·9
14	3342	64	Ad	n−1	11·8
14	3342	150	Wf	n−4, o+2	12·1
14	3342	120	Wi	m−5, o+7	11·7
16	3344	55	Bg	m−8, o+3	12·0*b*
16	3344	120	Bn	n−5, o+1	12·2
18	3346	90	Bh	o+2	12·1
20	3348	,,	,,	o+2	12·1
22	3350	64	Ad	=o	12·3*b*
22	3350	120	Bn	n−5, o+1	12·2
25	3353	90	Bh	=o, =p	12·3*b*
28	3356	120	Bn	o+1	12·2
Nov					
1	3360	157	Wf	=o	12·3
1	3360	90	Bh	=o, =p	12·3
2	3361	75	Bg	m−10, o+1	12·2*b*
4	3363	90	Bh	o−1	12·4
7	3366	120	Wi	o−1	12·4
9	3368	90	Bh	o+1	12·2
10	3369	157	Wf	o+2	12·1
10	3369	70	Gr	=o	12·3
14	3373	90	Bh	k−10, o+3	11·9*b*
17	3376	70	Gr	m−2	11·4
18	3377	150	Wf	o+2	12·1
19	3378	90	Bh	k−6, o+7	11·5
24	3383	,,	,,	k−2	11·1
24	3383	120	Bn	k (1) v (1) m	11·1
25	3384	65	Bg	=h	10·5*c*
28	3387	90	Bh	d−10, k+5	10·4
29	3388	50	Bn	g (2) v (1) h	10·4
Dec					
5	3394	90	Bh	d−5, k+10	9·9
6	3395	,,	,,	d−2	9·6

Oct. 22, Ad, Glimpsed.
Nov. 10, Gr, About.
Nov. 25, About.

1922 Dec					
11	3400	90	Bh	d+1	9·3
16	3405	55	Bg	c−2, d+3	9·1*c*
17	3406	45	Bh	=c	8·9
18	3407	50	Bn	c−4, d+1	9·3
19	3408	90	Bh	b−4, c+2	8·7
20	3409	48	Bg	c−2, d+3	9·1
24	3413	75	Bn	c−2, d+3	9·1
25	3414	90	Bh	c+1	8·8
26	3415	48	Bg	c−1, d+4	9·0*b*
28	3417	45	Bh	b−3, c+3	8·6*b*
1923 Jan					
3	3423	48	Bg	b−5, c+1	8·8*b*
4	3424	75	Bn	b (4) v (1) c	8·8
4	3424	90	Bh	b−4, c+2	8·7
8	3428	75	Bn	b (3) v (2) c	8·7
9	3429	48	Bg	b−4, c+2	8·7*b*
10	3430	75	Bn	b−2, c+4	8·5
11	3431	90	Bh	=b	8·3
14	3434	,,	,,	b+1	8·2
14	3434	75	Bn	b−2, c+4	8·5
18	3438	,,	,,	b (1) v (4) c	8·4
20	3440	62	Wf	=b	8·3
20	3440	90	Bh	b+1	8·2
Feb					
4	3455	,,	,,	a−3, b+2	8·1
7	3458	62	Wf	b+1	8·2
8	3459	90	Bh	b+1	8·2
23	3474	,,	,,	b−1	8·4
Mar					
2	3481	,,	,,	b−3, c+3	8·6
6	3485	,,	Wh	b (2) v (1) e	9·3
13	3492	,,	Bh	c−1	9·0
16	3495	45	,,	=c	8·9
21	3500	90	,,	c−2, d+2	9·2
25	3504	,,	,,	c−5	9·4
25	3504	,,	Wh	e+2	9·6
26	3505	31	D	c−4, d+0·5	9·4
Apr					
1	3511	90	Bh	c−7, d−2	9·6
4	3514	55	Bg	d−1, e+3	9·5*b*
6	3516	62	Wf	d−2, e+2	9·6
9	3519	45	Bh	=e	9·8
10	3520	150	Wf	g−3, h+3	10·3
13	3523	90	Bh	e−2, g+1	10·0
14	3524	,,	,,	=g	10·1
14	3524	55	Bg	e−3, =g	10·1
14	3524	90	Wh	=h	10·5
15	3525	62	Wf	f−4, h+2	10·4
17	3527	90	Bh	g−4	10·5
20	3530	55	Bg	=h	10·5*b*
22	3532	45	Bh	g−8, m+3	10·9
22	3532	150	Wf	k−5, =m, n+2	11·4
23	3533	60	D	n−3	12·0
May					
2	3542	150	Wf	n−5, p+3	12·1
3	3543	90	Bh	m−5, o+5	11·8
3	3543	75	Bg	m (4) v (7) o	11·6
7	3547	150	Wf	o+2	12·1
7	3547	90	Wh	=o	12·3
8	3548	,,	Bh	o+3	12·0
13	3553	,,	,,	o+1	12·2
14	3554	120	D	<o	<12·3
16	3556	110	Bg	m (3) v (1) o	12·0
17	3557	90	Bh	=o	12·3

May 14, Glimpsed.

(6549) W LYRÆ—*continued.*

1923					
May					
20	3560	157	Wf	=o	12·3
21	3561	120	Bn	p+1	12·2
21	3561	90	Bh	=o	12·3
30	3570	,,	,,	=o	12·3
June					
2	3573	,,	,,	o+1	12·2
3	3574	157	Wf	o+1, q+2	12·2
3	3574	90	Gr	=q	12·4*b*
9	3580	150	Wf	n−3, o+4	12·0
11	3582	90	Bh	g−7, m+4	10·8
11	3582	,,	Wh	<k	<10·9
21	3592	,,	Bh	=e	9·8
22	3593	55	Bg	e (1) v (2) g	9·9
23	3594	90	Bh	d−1, e+3	9·5
29	3600	55	Bg	c (3) v (2) d	9·2
July					
3	3604	62	Wf	c−4, d+2	9·3
4	3605	55	Bg	c (1) v (4) d	9·0
5	3606	90	Bh	c−3, d+2	9·2
5	3606	60	D	c−4, d+2	9·3
7	3608	90	Wh	=c	8·9
8	3609	62	Wf	c−4, =d	9·4
8	3609	50	Gr	=d	9·4
8	3609	,,	Bn	c−2, d+3	9·1
8	3609	55	Bg	c (1) v (4) d	9·0
12	3613	30	D	c−1, d+4	9·0
13	3614	75	Bg	=c	8·9
14	3615	45	Bh	c−2	9·1*b*
15	3616	62	Wf	b−4, c+1	8·8
16	3617	30	D	b−5, c+1	8·8
19	3620	50	Gr	=c	8·9
20	3621	30	D	b−4, c+2	8·7
20	3621	45	Bh	b−5, c+1	8·8
20	3621	55	Bg	b (1) v (2) c	8·5
22	3623	62	Wf	b (1) v (1) c	8·6
25	3626	55	Bg	a (2) v (3) b	8·0
29	3630	50	Gr	b−3, c+3	8·6
30	3631	90	Bh	=b	8·0
Aug					
2	3634	55	Bg	=a	7·8
3	3635	50	Bn	a−2, b+3	8·0
3	3635	90	Bh	b+1	8·2
3	3635	,,	Wh	=c	8·9
5	3637	55	Bg	=a	7·8*b*
6	3638	62	Wf	=b	8·3
8	3640	30	Bg	a+1	7·7
9	3641	90	Bh	b+3	8·0
9	3641	120	Ga	b−3, c+1	8·7
11	3643	50	Bn	a−4, b+1	8·2
11	3643	30	D	b−2, c+3	8·6
12	3644	62	Wf	b−2, c+2	8·6
13	3645	30	Bg	=a	7·8
15	3647	150	Wf	b−1, c+4	8·5
15	3647	90	Bh	b+1	8·2
18	3650	,,	,,	b+2	8·1
22	3654	50	D	a−4, b+1	8·2
22	3654	,,	Bn	a (3) v (1) b	8·2
22	3654	55	Bg	a (1) v (4) b	7·9
26	3658	90	Bh	b+3	8·0
28	3660	50	Bn	a−4, b+1	8·2
29	3661	,,	Gr	b−2	8·5*b*
29	3661	62	Wf	b−1, c+4	8·5
30	3662	90	Bh	b+3	8·0

1923					
Sept					
1	3664	30	D	b−1, c+5	8·4
2	3665	90	Wh	b+3	8·0
2	3665	,,	Bh	b+3	8·0
3	3666	30	D	b−2, c+4	8·5
4	3667	90	Bh	b+2	8·1
5	3668	50	Bn	=b	8·3
7	3670	62	Wf	b−1, c+4	8·5
7	3670	90	Bh	b+3	8·0
8	3671	55	Bg	=a	7·8
8	3671	30	D	b−2, c+4	8·5
10	3673	90	Wh	b (1) v (2) c	8·5
11	3674	50	Bn	b (1) v (4) c	8·4
11	3674	90	Bh	b+2	8·1
12	3675	50	Gr	b+2	8·1
12	3675	62	Wf	=b	8·3
12	3675	30	D	b−3, c+2	8·7
13	3676	55	Bg	a (2) v (3) b	8·0
13	3676	90	Bh	=b	8·3
16	3679	,,	,,	=b	8·3
16	3679	60	Ga	b−5, c+2	8·8
17	3680	55	Bg	a (4) v (1) b	8·2
18	3681	30	D	b−4, c+1	8·8
21	3684	50	Bn	b (2) v (1) c	8·7
22	3685	62	Wf	b−3, c+2	8·7
22	3685	90	Bh	b+1	8·2
26	3689	,,	,,	b−1	8·4
28	3691	50	Gr	=c	8·9
28	3691	90	Wh	c (1) v (2) e	9·2
30	3693	30	D	c−3, d+2	9·2
30	3693	62	Wf	c−1, d+4	9·0
30	3693	55	Bg	c (2) v (3) d	9·1
30	3693	90	Bh	b−3	8·6
Oct					
4	3697	,,	,,	b−4, c+2	8·7
4	3697	50	Bn	c−4, d+1	9·3
4	3697	90	Wh	b (1) v (1) e	9·1
8	3701	62	Wf	d−3, g+4	9·7
9	3702	90	Bh	c−2	9·1
9	3702	60	Ga	c−5, =d, e+5	9·4
10	3703	50	Gr	d+2	9·2
11	3704	90	Bh	d−1, g+6	9·5
14	3707	50	Bn	d (1) v (3) e	9·5
14	3707	55	Bg	d (1) v (3) e	9·5
17	3710	90	Bh	d−4, g+3	9·8
20	3713	,,	,,	d−7, =g	10·1
22	3715	95	Bn	=g	10·1
23	3716	45	Bh	g−4	10·5
25	3718	55	Bg	g (1) v (3) h	10·2*b*
27	3720	62	Wf	f−1, e−3, h+3	10·1
27	3720	60	Ga	=e, =g	9·9
28	3721	120	Bn	g−3, h+1	10·4
28	3721	90	Wh	g (1) v (1) h	10·3
31	3724	50	Gr	k+2	10·7
31	3724	62	Wf	f−4, h+1	10·4
Nov					
1	3725	90	Bh	g−7, m+4	10·8
3	3727	120	Bn	=k	10·9
4	3728	60	D	l−1, m+1	11·1
7	3731	50	Bn	k (1) v (1) m	11·1
7	3731	90	Bh	m−4, o+6	11·7*b*
8	3732	75	Bg	=k	10·9*b*
10	3734	30	D	m−2	11·4
10	3734	90	Bh	k−1, m+2	11·0
10	3734	120	Bn	m−2	11·4

June 3, Gr, About.
Aug. 22, D, 5-in. OG.

Sept. 16, Ga, T.
Oct. 9, 27, Ga, T.

(6549) W LYRÆ—*continued.*

1923 Nov					
14	3738	120	Bn	m−3	11·5
15	3739	75	Bg	=m	11·2
16	3740	90	Bh	o+1	12·2
18	3742	120	Bn	m−3	11·5
30	3754	,,	,,	o+3	12·0
30	3754	150	Wf	o+2, q+3	12·1
30	3754	90	Bh	m−10, o+1	12·2
Dec					
4	3758	,,	,,	o+2	12·1
4	3758	120	Bn	o+2, p+2, q+2	12·1
6	3760	90	Bh	o+1	12·2
8	3762	,,	,,	o+2	12·1
11	3765	157	Wf	n−4, o+3	12·1
16	3770	120	Bn	o+3, p+3	12·0
18	3772	90	Bh	m−7, o+4	11·9
24	3778	,,	,,	m+2	11·0*b*
30	3784	60	D	g−3, h+2	10·4*b*
1924 Jan					
3	3788	90	Bh	g−4	10·5
5	3790	,,	,,	g−2, e−5	10·3
6	3791	,,	Wh	e (2) v (1) g	10·0
6	3791	120	Bn	e (2) v (1) g	10·0
6	3791	48	Bg	d (3) v (1) e	9·7
7	3792	90	Bh	d−7, e−3	10·1
16	3801	,,	,,	d−2, g+5	9·6
17	3802	150	Wf	=c	8·9
25	3810	50	Bn	c (1) v (4) d	9·0
25	3810	90	Bh	c−3, d+2	9·2
27	3812	,,	,,	=c	8·9
31	3816	,,	,,	b−3, c+3	8·6
Feb					
1	3817	50	Bn	b (1) v (2) c	8·5
8	3824	62	Wf	=b	8·3
11	3827	90	Bh	=b	8·3*b*
14	3830	,,	,,	b+1	8·2
14	3830	30	D	a−4, b+1	8·2
16	3832	50	Bn	a (1) v (1) b	8·0
22	3838	45	Bh	a+3, b+8	7·5
24	3840	,,	,,	a+1, b+6	7·7
27	3843	90	,,	a−4, b+1	8·2
Mar					
2	3847	,,	,,	b+1	8·2
4	3849	,,	,,	b+1	8·2
4	3849	50	Bn	a−3, b+2	8·1
4	3849	30	D	b−2, c+3	8·6
7	3852	90	Bh	=b	8·3
8	3853	30	D	b−3, c+3	8·6
9	3854	50	Bn	b−1, c+5	8·4
9	3854	90	Bh	b+1	8·2
11	3856	,,	,,	=b	8·3
11	3856	30	D	b−2, c+3	8·6
13	3858	50	Bn	b+1·5	8·2
14	3859	90	Bh	b−1	8·4
19	3864	45	,,	b−3, c+3	8·6
22	3867	,,	,,	c+1	8·8
24	3869	55	Bg	b (1) v (2) c	8·5
26	3871	90	Bh	b−2, c+4	8·5
29	3874	,,	,,	b−2, c+4	8·5
29	3874	75	Bn	b−5, c+1	8·8
30	3875	55	Bg	b (2) v (1) c	8·7
30	3875	30	D	c−2, d+3	9·1
Apr					
1	3877	50	Bn	b−5, c+1	8·8
2	3878	90	Bh	b−4, c+2	8·7
4	3880	,,	,,	c+1	8·8

Dec. 30, Difficult.

1924 Apr					
4	3880	30	D	c−3, d+2	9·2
4	3880	50	Bn	b−5, c+1	8·8
6	3882	90	Bh	c−1	9·0
7	3883	55	Bg	=c	8·9
7	3883	50	Bn	c+0·5	8·9
11	3887	30	D	=d	9·4
11	3887	90	Bh	c (1) v (1) d	9·2
14	3890	,,	,,	d−1	9·5
20	3896	45	,,	d−4, g+3	9·8
20	3896	50	Bn	c−4, d+1	9·3
20	3896	55	Bg	=d	9·4*b*
24	3900	62	Wf	d−4, g+3	9·8
25	3901	90	Bh	d−4	9·8
27	3903	,,	Wh	=g	10·1
30	3906	,,	Bh	=e	9·8
30	3906	62	Wf	d−5, =g	10·0
May					
3	3909	90	Bh	d−5, e+1	9·8
4	3910	60	D	d−3, e+1	9·7
5	3911	90	Bh	=e	9·8
5	3911	55	Bg	d (1) v (1) e	9·6
5	3911	50	Bn	d (2) v (1) e	9·7
7	3913	30	D	d−4, e+1	9·8
9	3915	60	,,	=e	9·8
10	3916	90	Bh	g−5	10·6
12	3918	62	Wf	d−4, e+1	9·8
13	3919	60	D	=e	9·8
16	3922	90	Bh	g−2	10·3
16	3922	75	Bg	g (1) v (4) h	10·2
19	3925	120	Bn	g (3) v (2) h	10·3
22	3928	90	Bh	g−2	10·3
23	3929	60	D	g−1, h+3	10·2
25	3931	62	Wf	f−4, h+1	10·4
26	3932	90	Bh	g−3	10·4
27	3933	60	D	h−1, k+4	10·6
27	3933	90	Wh	=k	10·9
27	3933	50	Bn	g−3, h+1	10·4
27	3933	48	Bg	g (3) v (1) h	10·4
28	3934	62	Wf	f−5, h+1	10·5
30	3936	60	D	h−1, k+4	10·6
31	3937	90	Bh	g−5	10·6
June					
1	3938	60	D	h−3, k+2	10·8
2	3939	62	Wf	l−4, n+3	11·4
5	3942	75	Bg	h (1) v (3) k	10·6
5	3942	60	D	=k	10·9
11	3948	90	Bh	g−8, m+3	10·9
13	3950	,,	,,	f−10, m+2	11·0
17	3954	,,	,,	=m	11·2*c*
19	3956	,,	,,	m−1	11·3*c*
21	3958	60	D	h−3, k+1	10·8
21	3958	90	Wh	l (1) v (2) o	11·4
22	3959	75	Bg	h (3) v (2) k	10·7
23	3960	62	Wf	h−1, k+3	10·6
24	3961	90	Bh	m+5	10·7
26	3963	60	D	h−4, k+1	10·9
27	3964	62	Wf	=h, k+3	10·6
July					
1	3968	60	D	h−1, k+3	10·6
3	3970	62	Wf	g−1, h+3	10·2
6	3973	55	Bg	g (1) v (3) h	10·2
6	3973	60	D	=g	10·1
7	3974	62	Wf	=f, h+4	10·1
9	3976	60	D	g−1, h+4	10·2
10	3977	62	Wf	=e, g+2	9·8
13	3980	60	D	d−3, e+2	9·7
13	3980	50	Bn	d (3) v (1) e	9·7
19	3986	90	Bh	=g	10·1*b*

(6549) W LYRÆ—*continued.*

1924					
July					
19	3986	55	Bg	c (4) v (1) d	9·3
19	3986	90	Wh	=e	9·8
22	3989	62	Wf	d−4, g+4	9·8
24	3991	55	Bg	c (2) v (3) d	9·1
24	3991	90	Bh	d−1	9·5*b*
27	3994	,,	,,	b (1) v (1) c	8·6
27	3994	62	Wf	c−3, d+1	9·3
29	3996	50	Bn	c−3, d+2	9·2
29	3996	90	Bh	b−2, c+4	8·5
31	3998	60	D	b−4, c+1	8·8
Aug					
1	3999	62	Wf	b−2, c+4	8·5
2	4000	90	Wh	=c	8·9
2	4000	,,	Bh	=b	8·3*b*
5	4003	,,	,,	=b	8·3
5	4003	50	Bn	a−3, b+2	8·1
6	4004	62	Wf	c−1, d+4	9·0
7	4005	55	Bg	a (2) v (3) b	8·0
7	4005	50	Bn	a (3) v (2) b	8·1
8	4006	90	Bh	b+1	8·2
8	4006	30	D	b−2, c+5	8·5
9	4007	55	Bg	a (2) v (3) b	8·0
10	4008	60	D	=b	8·3
10	4008	62	Wf	=b, c+6	8·3
12	4010	50	Bn	a+2	7·6
13	4011	60	D	a−3, b+2	8·1
15	4013	90	Bh	a−3, b+2	8·1
17	4015	60	D	a−2, b+2	8·0
18	4016	30	Bg	a+2	7·6*b*
19	4017	50	Bn	a+2	7·6
19	4017	90	Bh	=a, b+5	7·8
21	4019	60	D	a−2, b+3	8·0
22	4020	30	Bg	a+3	7·5
22	4020	62	Wf	b+1·5	8·2
22	4020	90	Wh	=b	8·3
22	4020	,,	Bh	=a	7·8
25	4023	30	Bn	a+3	7·5
26	4024	F	Wf	a−2, b+3	8·0
27	4025	30	Bg	a+4	7·4
27	4025	45	Bh	a (1) v (1) b	8·0*b*
27	4025	60	D	=a	7·8
31	4029	62	Wf	a−1, b+4	7·9
31	4029	30	Bn	a+4	7·4
31	4029	,,	Bg	a+5	7·3
Sept					
2	4031	90	Bh	a+1	7·7
3	4032	,,	Wh	b+2	8·1
5	4034	60	D	a−2, b+3	8·0
7	4036	62	Wf	a+1, b+4	7·8
8	4037	50	Bn	a+4	7·4
8	4037	90	Bh	a (1) v (1) b	8·0
10	4039	40	D	a−1, b+4	7·9*b*
11	4040	30	Bn	a+4	7·4
12	4041	,,	D	a−1, b+4	7·9
14	4043	50	Bn	a+4	7·4
16	4045	90	Bh	b+2	8·1
22	4051	60	D	=b	8·3
22	4051	50	Bn	a+1	7·7
22	4051	55	Bg	b (1) v (5) c	8·4
23	4052	90	Bh	b−1	8·4
26	4055	,,	,,	b−1	8·4
26	4055	60	D	b−2, c+3	8·6
27	4056	62	Wf	b−2, c+4	8·5
28	4057	55	Bg	b (2) v (1) c	8·7*b*
29	4058	90	Bh	b−2	8·5

July 31, Aug. 17, 27, D, 5^{c}.
Aug. 5, Bh, Unsteady. Aug. 10, D, 4^{c}·5.

1924					
Oct					
1	4060	90	Bh	b−3, c+3	8·6
1	4060	,,	Wh	=c	8·9
5	4064	62	Wf	b−5, =c	8·9
5	4064	45	Bh	b (2) v (1) c	8·7
8	4067	75	Bg	c (2) v (3) d	9·1
11	4070	90	Bh	=c	8·9*b*
12	4071	50	Bn	c (3) v (1) d	9·3
13	4072	55	Bg	c (1) v (1) d	9·2
13	4072	45	Bh	=c	8·9
15	4074	90	,,	c−1	9·0
16	4075	62	Wf	c−3, d+1	9·3
17	4076	90	Wh	c (2) v (1) e	9·5
17	4076	,,	Bh	c−1	9·0
20	4079	45	Bh	c−2, d+3	9·1
22	4081	50	Bn	d (3) v (2) g	9·8
23	4082	75	Bg	d (3) v (1) e	9·7
23	4082	40	D	=d	9·4
23	4082	90	Bh	=d	9·4
25	4084	,,	,,	e+1	9·7
27	4086	45	,,	=e	9·8*b*
31	4090	90	,,	e−2, g+1	10·0*b*
31	4090	,,	Wh	=e	9·8
Nov					
3	4093	50	Bn	e−1, g+2	9·9*b*
3	4093	90	Bh	e−3, g+1	10·0
4	4094	,,	,,	=e	9·8
4	4094	40	D	d−3, f+2	9·8
4	4094	44	Li	d (5) v (5) e	9·6
5	4095	90	Bh	g−1	10·2
7	4097	44	Li	d (5) v (5) e	9·6*b*
8	4098	90	Bh	=g	10·1
10	4100	,,	,,	g+1	10·0
14	4104	40	D	f−1	10·1
15	4105	90	Wh	=e	9·8
15	4105	,,	Bh	e−3, g+1	10·0
17	4107	94	Li	g (2) v (8) h	10·2
17	4107	120	Bn	g (1) v (1) h	10·3
19	4109	90	Bh	g−2	10·3*b*
21	4111	,,	Wh	e (2) v (1) k	10·5
24	4114	,,	Bh	g−3	10·4
25	4115	,,	,,	g−4	10·5
27	4117	55	Bg	g (1) v (1) h	10·3
27	4117	120	Bn	g−3, h+1	10·4
28	4118	90	Bh	g (1) v (3) m	10·4
30	4120	,,	Wh	=m	11·2
Dec					
1	4121	90	Bh	=g	10·1
2	4122	,,	,,	e (1) v (1) g	9·9
4	4124	,,	,,	e (1) v (1) g	9·9
5	4125	120	Bn	h−1, k+3	10·6
6	4126	94	Li	g (3) v (7) h	10·2*b*
6	4126	90	Bh	=g	10·1
9	4129	,,	,,	g−2	10·2*b*
9	4129	120	Bn	h (1) v (1) k	10·7
10	4130	193	Li	h (5) v (5) k	10·7*b*
12	4132	90	Bh	g−3	10·4
14	4134	45	,,	g−3	10·4
14	4134	94	Li	=k	10·9
14	4134	120	Bn	=k	10·9
19	4139	90	Bh	g−1	10·2
22	4142	45	,,	g−2	10·3
24	4144	90	,,	g−1	10·2
26	4146	,,	,,	g−2	10·3
26	4146	,,	Wh	k (1) v (2) o	11·4
28	4148	,,	Bh	g−2	10·3
31	4151	,,	,,	g−3	10·4
31	4151	75	Bg	k (2) v (1) m	11·1*b*

(6550) R Y OPHIUCHI. (V. 17.)

H.D. 181103.

Date.	Julian Date.	Inst.	Observer.	Comparisons.	Deduced Mag.
1920 Jan					
5	2329	45	Bh	b+3	7·9*b*
16	2340	90	,,	b+1	8·1*b*
21	2345	,,	,,	=b	8·2*b*
24	2348	45	,,	b+1	8·1
26	2350	90	,,	=b	8·2
Feb					
5	2360	,,	,,	b+1	8·1
10	2365	45	,,	b−6, d+5	8·9
15	2370	90	,,	d+1	9·3
18	2373	,,	,,	d−2	9·6
23	2378	45	,,	h+2	10·5
29	2384	90	,,	h−4, k+2	11·1
Mar					
6	2390	45	,,	k−2	11·5
12	2396	90	,,	k−5, m+2	11·8
16	2400	,,	,,	=m	12·0
25	2409	,,	,,	n−2	12·4
31	2415	,,	,,	<o	<12·5
Apr					
9	2424	,,	,,	<o	<12·5
12	2427	,,	,,	q−1	13·1
17	2432	,,	,,	=n, =o	12·4*b*
27	2442	,,	,,	h−3, k+3	11·0
May					
7	2452	45	Br	e−3, g+5	10·1
7	2452	50	Bn	e (3) v (1) f	10·2
7	2452	90	Bh	d−3, h+10	9·7
9	2454	,,	,,	d−2	9·6
10	2455	60	D	d−1	9·5
12	2457	90	Bh	d+1	9·3
13	2458	,,	,,	d+2	9·2
17	2462	,,	,,	d+2	9·2
19	2464	50	Bn	b (5) v (2) d	9·1
21	2466	,,	,,	b (3) v (1) d	9·1
21	2466	45	Bh	b−2, d+10	8·4
21	2466	30	D	c−3, d+5	9·0*b*
22	2467	45	Br	b−1	8·3
23	2468	75	Bn	b−1·5	8·3
23	2468	90	Bh	b+3	7·9
25	2470	,,	,,	a−3, b+3	7·9
29	2474	,,	,,	=a	7·6
29	2474	75	Bn	a (3) v (1) b	8·0
June					
1	2477	50	,,	a (1) v (2) b	7·8
2	2478	45	Bh	a+2	7·4
4	2480	90	,,	a+2	7·4
5	2481	75	Bn	a (2) v (1) b	8·0
5	2481	45	Br	a−0·5	7·7
8	2484	30	D	a−3, b+2	8·0
8	2484	50	Bn	a (1) v (3) b	7·8
8	2484	45	Bh	a+2	7·4
11	2487	30	D	a−4, b+3	8·0
15	2491	,,	,,	a−4, b+2	8·0
15	2491	45	Bh	a−2, b+5	7·8*b*
18	2494	,,	,,	a−1, b+6	7·7
1920 June					
18	2494	50	Bn	a+2	7·4
19	2495	45	Br	a+1	7·5
19	2495	30	D	a−7, c+3	8·3
22	2498	,,	,,	b−3, c+2	8·5
23	2499	45	Bh	a−5, b+2	8·1
29	2505	90	,,	=b	8·2
July					
7	2513	,,	,,	b−6, d+3	9·0
8	2514	30	D	d−3, e+1	9·7
10	2516	45	Bh	d−1	9·5
12	2518	30	D	e−3, f+3	10·1*b*
14	2520	50	Bn	e (5) v (1) f	10·3
14	2520	43	Gi	e−5, h+3	10·4*b*
15	2521	90	Bh	d−5	9·9*b*
17	2523	45	Br	=f	10·4
19	2525	120	Bn	=h	10·7
19	2525	60	D	h−4, k+2	11·1*b*
24	2530	43	Gi	=k	11·3*b*
24	2530	90	Bh	h−3, k+3	11·0
26	2532	,,	,,	k−3	11·6*b*
30	2536	,,	,,	k−10, m−3	12·3
30	2536	75	Gi	k−1	11·4*b*
Aug					
6	2543	90	Bh	o−4, q+1	12·9
6	2543	120	Br	q+3	12·7
7	2544	75	Gi	=n	12·2*b*
8	2545	90	Bh	o−3	12·8*b*
9	2546	120	Bn	<n	<12·2
13	2550	90	Bh	=q	13·0
18	2555	,,	,,	q−1	13·1
19	2556	75	Gi	=o	12·5*b*
26	2563	90	Bh	q−1	13·1
29	2566	,,	,,	q−1	13·1
Sept					
1	2569	,,	,,	q+1	12·9
3	2571	117	Gi	q−4	13·4*c*
4	2572	90	Bh	q+2	12·8
10	2578	,,	,,	q+2	12·8*b*
10	2578	120	Br	=q	13·0*b*
11	2579	,,	,,	q−2	13·2
13	2581	90	Bh	q+3	12·7
15	2583	170	Gi	q−2·5	13·2*b*
19	2587	90	Bh	q+2	12·8*b*
22	2590	,,	,,	m−2	12·2
26	2594	,,	,,	k−4, m+3	11·7
26	2594	120	Br	k−3, n+6	11·6
29	2597	90	Bh	k−1	11·4
Oct					
1	2599	,,	,,	h−2, k+4	10·9
1	2599	120	Br	=h	10·7
6	2604	90	Bh	h+2	10·5

Mar. 31, Apr. 9, Not seen.

July 12, Difficult.
July 19, D, Difficult.
Aug. 8, Yellow.
Aug. 9, t. Just seen.
Sept. 11, Better than on Sept. 10.

(6550) R Y OPHIUCHI—*continued.*

1920					
Oct					
6	2604	117	Gi	h+1·5	10·6*b*
7	2605	45	Br	f+2	10·2
9	2607	,,	Bh	h+3	10·4
12	2610	90	,,	d−9, h+4	10·3
17	2615	,,	,,	d−1	9·5
18	2616	,,	,,	d+2	9·2
22	2620	,,	,,	d+5	8·9
24	2622	,,	,,	b−8, d+4	9·0
24	2622	50	Bn	b (4) v (1) d	9·2
27	2625	,,	,,	b (4) v (1) d	9·2
27	2625	117	Gi	c−0·5	8·7*b*
29	2627	45	Br	b−1	8·3
29	2627	,,	Bh	b−4, d+8	8·6
Nov					
1	2630	90	,,	b−6, d+6	8·8
2	2631	50	Bn	b+1	8·1
9	2638	90	Bh	b+3	7·9*b*
13	2642	,,	,,	b+2	8·0
13	2642	117	Gi	b−2·5, c+4	8·4
18	2647	45	Br	b−1	8·3
20	2649	90	Bh	b+3	7·9*b*
21	2650	50	Bn	b (3) v (1) d	9·1
22	2651	45	Bh	b−2, d+10	8·4
Dec					
1	2660	160	Br	e−1	9·9
3	2662	50	Bn	e−1	9·9
5	2664	90	Bh	d−8, h+5	10·2*c*
8	2667	,,	,,	h+7, k+13	10·0*b*
8	2667	75	Gi	e−2·5, f+3	10·1*b*
9	2668	50	Bn	e−5, f+1	10·3*b*
17	2676	90	Bh	=h	10·7*b*
22	2681	,,	,,	h−3, k+3	11·0*b*
26	2685	,,	,,	<k	<11·3
1921					
Jan					
7	2697	,,	,,	k−10, =m, =n	12·2*b*
10	2700	,,	,,	=n	12·2*b*
13	2703	,,	,,	n−2	12·4
13	2703	75	Bn	<k	<11·3
21	2711	117	Gi	o−3·5	12·9*b*
30	2720	90	Bh	n−4, q+4	12·6
Feb					
2	2723	,,	,,	n−6, q+2	12·8
9	2730	,,	,,	n−8	13·0*b*
15	2736	117	Gi	n−3·5, o+2	12·5*b*
17	2738	90	Bh	k−10, o+1	12·3
25	2746	,,	,,	k−4, m+3	11·7
27	2748	117	Gi	=l	11·7*b*
Mar					
2	2751	50	Bn	<k	<11·3
2	2751	90	Bh	h−7, k−1	11·4
6	2755	,,	,,	h−3, k+3	11·0
11	2760	,,	,,	d−7, h+6	10·1
14	2763	117	Gi	h+2	10·5*b*
16	2765	90	Bh	=d	9·4
24	2773	45	,,	a−5, b+1	8·1
31	2780	50	Bn	a (2) v (1) b	8·0
31	2780	47	Gi	a−5, b+2·5	8·0
Apr					
1	2781	90	Bh	a−3, b+3	7·9
4	2784	45	,,	a−3, b+3	7·9
7	2787	30	Bn	a (1) v (3) b	7·8

Dec. 22, Difficult.
Dec. 26, Not seen.
Jan. 13, Bn, Not seen.
Mar. 2, Bn, Doubtfully seen.

1921					
Apr					
8	2788	90	Bh	a−4, b+2	8·0
11	2791	75	Gi	a−2, b+6	7·7
12	2792	90	Bh	a−2, b+4	7·8
15	2795	45	,,	a−3, b+3	7·9
19	2799	90	,,	a−3, b+3	7·9
23	2803	,,	,,	=b	8·2
25	2805	,,	,,	a−4, b+2	8·0
28	2808	45	Br	b−1	8·3
29	2809	90	Bh	=b	8·2
May					
5	2815	47	Gi	c−5, d+2·5	9·2
8	2818	50	Bn	e (2) v (1) f	10·2
9	2819	90	Bh	d−1	9·5
15	2825	,,	,,	d−10, h+3	10·4
24	2834	150	Wf	m (1) v (1) n	12·1
24	2834	120	Bn	m (1) v (1) n	12·1
25	2835	150	Bh	k−3	11·6
29	2839	117	Gi	=n	12·2
31	2841	60	D	l−3	12·0*b*
June					
2	2843	90	Bh	=n	12·2
2	2843	150	Wf	n−2, o+1	12·4
7	2848	120	Br	<n	<12·2
7	2848	150	Bn	n (3) v (2) o	12·4
9	2850	117	Gi	q−3	13·3*b*
9	2850	150	Wf	q−1	13·1*b*
10	2851	90	Bh	n−5	12·5
11	2852	150	Bn	q−3	13·3*b*
21	2862	90	Bh	n−10	13·2
24	2865	117	Gi	q−5	13·5*b*
27	2868	90	Bh	Estimated	<13·0
30	2871	120	Bn	<n	<12·2
July					
4	2875	117	Gi	q−6	13·6
7	2878	120	Br	<q	<13·0
7	2878	150	Wf	q−7	13·7*c*
11	2882	90	Bh	Estimated	<13·0
13	2884	150	Wf	q−5	13·5*b*
14	2885	117	Gi	q−5	13·5*b*
23	2894	150	Wf	n−2, o+1	12·4
26	2897	120	Bn	n−1	12·3*b*
26	2897	90	Bh	k−10, n−1	12·3
27	2898	117	Gi	m−1·5, n+1·5	12·1*b*
30	2901	150	Wf	m−2, n+0·5	12·2
Aug					
2	2904	90	Bh	k−4	11·7
6	2908	150	Wf	k (1) v (1) l	11·5
6	2908	117	Gi	h−4, k+1·5	11·1
7	2909	90	Bh	h−5, k+1	11·2
8	2910	75	Bn	k−1	11·4*b*
12	2914	90	Bh	d−10, h+3	10·4
15	2917	,,	,,	d−6, f+4	10·0
19	2921	,,	,,	d−3, h+10	9·7
22	2924	117	Gi	c−7, d+1	9·4
25	2927	75	Bn	d+1	9·3*b*
25	2927	62	Wf	c−6, d+2	9·3
25	2927	90	Bh	d+1	9·3
30	2932	,,	,,	d+4	9·0
30	2932	45	Br	d+2	9·2

April 29, Yellow.
May 31, Difficult.
June 7, July 7, Br, Not seen.
June 27, July 11, Not seen.
July 13, 23, 30, 9-in.
Aug. 6, Wf, 6-in.
Aug. 25, Wf, 3-in.

(6550) R Y OPHIUCHI—*continued.*

1921 Sept					
1	2934	47	Gi	c−2, d+3·5	9·0
3	2936	75	Bn	b (5) v (1) d	9·2
5	2938	90	Bh	d+6	8·8
6	2939	75	Bn	d+2	9·2
9	2942	62	Wf	c−7, d+3	9·3
10	2943	75	Bn	b (3) v (1) d	9·1
10	2943	45	Br	b−3, d+5	8·7
10	2943	90	Bh	b+3	7·9
12	2945	117	Gi	c−1, d+3·5	8·9
15	2948	75	Bn	d+2	9·2
16	2949	90	Bh	=b	8·2
21	2954	45	,,	b−2	8·4
21	2954	50	Bn	d+2	9·2
23	2956	62	Wf	c−4, d+3	9·1
24	2957	45	Br	b−8, d+4	9·0
24	2957	50	Bn	d+2	9·2
24	2957	90	Bh	b−4	8·6
25	2958	75	Gi	c−2·5, d+3	9·0
28	2961	45	Bh	b−6, d+5	8·9
30	2963	,,	,,	d+5	8·9
Oct					
3	2966	62	Wf	e−1, f+4	9·9
4	2967	50	Bn	d+1	9·3
5	2968	90	Bh	d−1	9·5
7	2970	75	Gi	e−1·5, f+9	9·7
8	2971	50	Bn	e (1) v (2) f	10·0
14	2977	120	Br	h+3	10·4
15	2978	45	Bh	h+2	10·5
17	2980	90	,,	=h	10·7
18	2981	120	Bn	h (1) v (2) k	10·9
21	2984	62	Wf	l−1, m+4	11·7
23	2986	120	Bn	l (4) v (1) m	12·0
23	2986	90	Bh	k−2	11·5
27	2990	,,	,,	k−4	11·7
30	2993	120	Bn	n (3) v (1) o	12·4*b*
30	2993	117	Gi	=n	12·2*b*
31	2994	90	Bh	k−5	11·8
Nov					
6	3000	120	Br	q−1	13·1
6	3000	,,	Bn	n−2	12·4*b*
6	3000	90	Bh	k−8	12·1
8	3002	150	Wf	n−2, o+3	12·3
16	3010	90	Bh	<n	<12·2
18	3012	117	Gi	q−4	13·4*c*
26	3020	90	Bh	q−2	13·2
28	3022	117	Gi	q−4·5	13·4*c*
Dec					
3	3027	90	Bh	<q	<13·0
1922 Jan					
13	3068	...	Gi	c (1) v (3·5) d	8·8
18	3073	90	Bh	b+2	8·0*b*
20	3075	,,	,,	a−1, b+5	7·7
Feb					
2	3088	45	,,	a−3, b+3	7·9*b*
4	3090	...	Gi	a (3·5) v (3·5) b	7·9
17	3103	90	Bh	a−8, b+2	8·4
24	3110	...	Gi	c (1·5) v (3·5) d	8·9
26	3112	62	Wf	e−1, f+4	9·9
Mar					
4	3118	45	Bh	d−6, h+7	10·0*b*
13	3127	...	Gi	f (1·5) v (1) h	10·6

Sept. 9, 3-in.
Sept. 23, Oct. 3, 3-in.
Oct. 21, 6-in.
Nov. 16, Dec. 3, Not seen.

1922 Mar					
19	3133	45	Bh	k−3	11·6
19	3133	150	Wf	l (1) v (1) m	11·9
26	3140	,,	,,	=n	12·2
28	3142	90	Bh	=m, =n	12·1
Apr					
4	3149	,,	,,	Estimated	<12·5*b*
4	3149	150	Wf	o−4, q+1	12·9
9	3154	,,	Bh	q+1	12·9
14	3159	90	,,	q−1	13·1
18	3163	,,	,,	q−1	13·1
19	3164	150	Wf	o−3, q+2	12·8
27	3172	...	Gi	q−3·5	13·3
29	3174	157	Wf	q−5	13·5
29	3174	150	Bh	q−3	13·3
May					
6	3181	120	Bn	=o	12·5
8	3183	90	Bh	<q	<13·0
12	3187	,,	,,	m−5, q+5	12·5
14	3189	150	Wf	n−3, o+1	12·5
17	3192	...	Gi	m (3) v (1) n	12·2
17	3192	90	Bh	k−10, m−3	12·3*b*
21	3196	,,	,,	k−6, m+1	11·9
21	3196	150	Wf	=m, n+3	12·0
21	3196	120	Bn	m (2) v (1) n	12·2
22	3197	62	D	<k	<11·3
25	3200	160	Br	k−2	11·5
26	3201	90	Bh	k−3	11·6*b*
27	3202	,,	,,	k−2, m+5	11·5
27	3202	...	Gi	=k	11·3
29	3204	62	Wf	h−4, =k	11·2
June					
1	3207	120	Bn	h (3) v (1) k	11·1
4	3210	90	Bh	h+1, k+7	10·6
12	3218	,,	,,	d−3	9·7
12	3218	62	Wf	d−4, f+6	9·8*b*
14	3220	...	Gi	d+1. e+2	9·5
19	3225	90	Bh	b−10, d+3	9·2*b*
24	3230	62	Wf	a−7, b+2	8·2
26	3232	90	Bh	=b	8·2*b*
28	3234	...	Gi	=b, c+3·5	8·3
29	3235	45	Bh	a−2, b+4	7·8
July					
2	3238	62	Wf	a−3, b+3	7·9
2	3238	45	Bh	a−3, b+3	7·9
10	3246	,,	,,	a−4, b+2	8·0
10	3246	,,	Br	a−4, b+2	8·0
10	3246	...	Gi	a (4) v (1) b	8·1
14	3250	90	Bh	a−4, b+2	8·0
20	3256	,,	,,	=b	8·2
20	3256	75	Bn	b (3) v (2) d	8·9
22	3258	...	Gi	b (3) v (1) c	8·6
23	3259	62	Wf	b−8, d+5	9·0
27	3263	45	Bh	b−8, d+4	9·0
30	3266	,,	Br	d−1	9·5
30	3266	62	Wf	=d	9·4
Aug					
1	3268	...	Gi	d (1) v (1·5) e	9·6
5	3272	45	Bh	=d	9·4*b*
11	3278	,,	,,	d−8	10·2*b*
12	3279	...	Gi	h+1	10·6
15	3282	75	Bn	k (3) v (1) l	11·6
16	3283	150	Wf	h−3, k+2	11·1
17	3284	90	Bh	h−8, k−2, m+5	11·5
20	3287	,,	,,	k−4	11·7
20	3287	120	Br	=k	11·3

July 2, Wf, Reddish.

(6550) R Y OPHIUCHI—*continued.*

1922 Aug					
20	3287	150	Wf	=l	11·7
22	3289	...	Gi	=k	11·3
23	3290	150	Wf	=m, n+2	12·0
23	3290	90	Bh	k−6, n+3	11·9
25	3292	,,	,,	=m	12·0
27	3294	150	Wf	m−1, n+1	12·1
31	3298	90	Bh	n−1	12·3*b*
Sept					
7	3305	157	Wf	q−1	13·1
11	3309	150	,,	o−3, q+2	12·8
14	3312	157	,,	q−3	13·3*b*
15	3313	150	Bh	q−2	13·2
16	3314	157	Wf	q−3	13·3
17	3315	...	Gi	q−4	13·4
19	3317	157	Wf	q−4	13·4*b*
21	3319	90	Bh	q−2	13·2
22	3320	120	Br	q−4	13·4
23	3321	157	Wf	q−4	13·4
26	3324	90	Bh	m−10	13·0*b*
Oct					
4	3332	,,	,,	<q	<13·0
5	3333	157	Wf	q−1	13·1
6	3334	90	Bh	<o	<12·5
11	3339	,,	,,	Estimated	<13·0
14	3342	,,	,,	o−2	12·7
14	3342	120	Br	n+2	12·0
14	3342	,,	Bn	<o	<12·5
14	3342	...	Gi	=m	12·0
14	3342	157	Wf	m−1·5, n+0·5	12·2
18	3346	90	Bh	m−1	12·1*b*
20	3348	,,	,,	m+1	11·9
25	3353	,,	,,	d−12, h+1	10·6
28	3356	50	Bn	e (2) v (1) f	10·2*b*
Nov					
1	3360	45	Br	e−2, h+6	10·1*b*
1	3360	62	Wf	f+4	10·0
1	3360	90	Bh	d−1	9·5
4	3363	45	,,	=d	9·4
4	3363	50	Bn	e−1, f+5	9·0
5	3364	...	Gi	d−1·5, =e	9·7
9	3368	45	Bh	b−10, d+2	9·2
10	3369	62	Wf	c−4, d+3	9·1
13	3372	45	Br	d+2	9·2
15	3374	50	Bn	d (1) v (1) e	9·6
17	3376	90	Bh	b−6, d+6	8·8
20	3379	...	Gi	a (3·5) v (4) c, b+1·5	8·1
24	3383	45	Br	=b	8·2
24	3383	90	Bh	b+1	8·1
28	3387	,,	,,	a−4, b+2	8·0
Dec					
1	3390	45	,,	a−3, b+3	7·9*b*
6	3395	90	,,	b+2	8·0
7	3396	...	Gi	a (4·5) v (3) b	8·0
9	3398	90	Bh	a−3, b+3	7·9
11	3400	,,	,,	b+2	8·0
17	3406	45	,,	=b	8·2
25	3414	,,	,,	b−4, d+8	8·0*b*
1923 Jan					
11	3431	,,	,,	d−3	9·7
Feb					
4	3455	90	,,	k−10, m−4	12·3*b*
1923 Mar					
2	3481	90	Bh	Estimated	<12·9
13	3492	,,	,,	=m, =n	12·1
17	3496	,,	,,	k−5, m+2	11·8
21	3500	,,	,,	=k	11·3
24	3503	117	Gi	=k	11·3
Apr					
1	3511	90	Bh	h+2, k+8	10·5
6	3516	62	Wf	e−2, h+5	10·1
11	3521	117	Gi	c (3·5) v (3·5) d	9·1
13	3523	90	Bh	d+1	9·3
14	3524	,,	,,	b−5	8·7
15	3525	62	Wf	c−4, d+3	9·1
16	3526	90	Bh	b−2	8·4
22	3532	,,	,,	b+2	8·0
23	3533	62	Wf	=b	8·2
29	3539	117	Gi	a (4) v (4) c, =b	8·2
May					
3	3543	45	Bh	b+2	8·0*b*
7	3547	,,	Br	a−3, b+3	7·9
7	3547	62	Wf	a−6, b+2	8·1
9	3549	45	Bh	a−3, b+3	7·9
11	3551	117	Gi	b (1) v (3) c	8·3
17	3557	90	Bh	=b	8·2
20	3560	62	Wf	c−3, d+7	8·9
30	3570	90	Bh	d+3	9·1
June					
2	3573	,,	,,	d−5	9·9
3	3574	150	Wf	e−3, f+3	10·1
8	3579	117	Gi	e (4) v (1·5) f	10·2*b*
9	3580	150	Wf	h−3, k+1	11·1
11	3582	90	D	h−4, k+3	11·1
11	3582	90	Bh	h−1, k+5	10·8
21	3592	,,	,,	k−3	11·0
30	3601	45	,,	k−8	12·1*b*
July					
1	3602	157	Wf	=p, q+3	12·7
4	3605	117	Gi	=o	12·5
5	3606	90	Bh	m−3	12·3
8	3609	157	Wf	q−2	13·2
8	3609	120	Bn	q+1	12·9
14	3615	90	Bh	=q	13·0*b*
15	3616	150	Wf	q−3	13·3
20	3621	117	Gi	q−5	13·5*b*
21	3622	90	Bh	q−3	13·3
22	3623	157	Wf	q−4	13·4
26	3627	OG	Ph	<q	<13·0
30	3631	90	Bh	o−8, q−3	13·3
Aug					
2	3634	150	,,	o−7, q−2	13·2
3	3635	120	Br	q−2	13·2
4	3636	150	Bn	q−2	13·2
4	3636	OG	Ph	o−4, p−3, q−2	13·0
6	3638	150	Wf	q−3	13·3
8	3640	OG	Ph	o−4, p−3, =q	13·0
8	3640	90	Bh	o−3, q+2	12·8
11	3643	,,	,,	=o	12·5
11	3643	150	Bn	o (1) v (1) p	12·6
12	3644	157	Wf	n−5, q+2	12·8
15	3647	150	Bn	n (2) v (1) o	12·4
15	3647	OG	Ph	m−1, =n	12·2
15	3647	150	Wf	m−1, n+1	12·1
15	3647	90	Bh	o+5, n+2	12·0
18	3650	,,	,,	k−3	11·0
23	3655	,,	,,	h−3, k+3	11·0

Sept. 22, About.
Oct. 4, 6, 11, Not seen.
Nov. 1, Br, Somewhat doubtful.

Mar. 2, Not seen.
July 26, Invisible.

(6550) R Y OPHIUCHI—*continued.*

1923 Aug					
26	3658	90	Bh	h+1	10·6
29	3661	62	Wf	e−5, f+1	10·3
30	3662	50	Bn	e−5, f+1	10·3
30	3662	90	Bh	h+5	10·2
Sept					
2	3665	,,	,,	h+5	10·2
2	3665	160	Br	e−3, h+6	10·1
4	3667	90	Bh	d−6, h+7	10·0
5	3668	50	Bn	d (3) v (1) e	9·7
7	3670	90	Bh	d−1	9·5*b*
7	3670	62	Wf	=d, e+4	9·4
8	3671	50	Bn	d+1	9·3
10	3673	90	Bh	d+2	9·2
11	3674	50	Bn	d+2	9·2
12	3675	62	Wf	c−2, d+6	8·9
13	3676	90	Bh	d+3	9·1
15	3678	45	Br	b−3	8·5
15	3678	50	Bn	b (2) v (1) d, d+4	9·0
16	3679	90	Bh	b−6, d+5	8·9
21	3684	,,	,,	a−6, b+1	8·2
21	3684	50	Bn	b−1	8·3
22	3685	90	Bh	a−4, b+3	8·0
22	3685	62	Wf	a−5, b+2	8·1
23	3686	50	Bn	a−4, b+2	8·0
27	3690	90	Bh	a−2, b+5	7·8
29	3692	50	Bn	a−3, b+3	7·9
29	3692	62	Wf	a−2, b+3	7·9
29	3692	45	Br	a+1	7·5
30	3693	90	Bh	a+2	7·4
Oct					
1	3694	,,	,,	a+2	7·4
4	3697	,,	,,	a+1	7·5
4	3697	50	Bn	a−4, b+2	8·0
5	3698	45	Bh	=a	7·6
7	3700	90	,,	=a	7·6
8	3701	62	Wf	b−1, c+4	8·3
9	3702	90	Bh	a−1, b+5	7·7
11	3704	,,	,,	a−3, b+3	7·9
14	3707	45	Br	a−2, b+4	7·8
14	3707	50	Bn	a−5, b+1	8·1
17	3710	90	Bh	b+3	7·9*b*
19	3712	45	,,	b+1	8·1
21	3714	90	,,	b−3	8·5
22	3715	50	Bn	b−7, d+5	8·9
23	3716	45	Bh	b−6, d+6	8·8
27	3720	62	Wf	b−7, d+5	8·9
31	3724	,,	,,	d−2, e+2	9·6
Nov					
4	3728	50	Bn	e (3) v (2) f	10·1
5	3729	45	Br	e−4, g+4	10·2*b*
7	3731	50	Bn	e−5, f+1	10·3
7	3731	90	Bh	h+3	10·4
10	3734	,,	,,	h+1	10·6
10	3734	50	Bn	=g	10·6
14	3738	120	,,	h−4, k+2	11·1
16	3740	90	Bh	k−2	11·5
23	3747	,,	,,	k−10, m−3	12·3*b*
30	3754	150	Wf	n−1, o+2	12·3
30	3754	120	Bn	<n	<12·2
30	3754	90	Bh	m−5	12·5*b*
Dec					
4	3758	,,	,,	<n	<12·2
12	3766	150	Wf	q−3	13·3*b*

Oct. 11, 17, 19, Orange-red.
Oct. 23, Yellow.
Nov. 30, Bn, Perhaps seen.
Dec. 4, Not visible.

1924 Jan					
5	3790	90	Bh	<k	<11·3
11	3796	,,	,,	<k	<11·3
16	3801	,,	,,	h−2, k+4	10·9
23	3808	45	,,	d (1) v (1) h	10·1
26	3811	90	,,	d−3, h+10	9·7
Feb					
1	3817	45	,,	=d	9·4*b*
1	3817	50	Bn	d+1	9·3
8	3824	62	Wf	d+2	9·2*b*
11	3827	45	Bh	b−2	8·4*b*
14	3830	,,	,,	b−6, d+8	8·7
16	3832	50	Bn	a−5, b+1	8·1
22	3838	45	Bh	a−3, b+3	7·9
26	3842	90	,,	a−3, b+3	7·9
Mar					
2	3847	,,	,,	a−2, b+4	7·8
4	3849	50	Bn	b+1	8·1
9	3854	,,	,,	b+1	8·1
10	3855	45	Bh	a−4, b+2	8·0
13	3858	50	Bn	b (1) v (1) c	8·4
14	3859	90	Bh	a−3, b+3	7·9
19	3864	,,	,,	=b	8·2
26	3871	,,	,,	b−4	8·6*b*
29	3874	,,	,,	=d	9·4*b*
Apr					
1	3877	50	Bn	f (1) v (1) g	10·5
3	3879	90	Bh	h+1	10·6
4	3880	50	Bn	k−4, l+1	11·7
6	3882	45	Bh	k−1	11·4*b*
9	3885	50	Bn	l−3	12·0
14	3890	90	Bh	k−10, n−1	12·3
16	3892	,,	,,	n−3, q+5	12·5*b*
24	3900	157	Wf	q−3	13·3
25	3901	90	Bh	n−5	12·7
30	3906	,,	,,	n−5	12·7*b*
May					
5	3911	,,	,,	=q	13·0
7	3913	157	Wf	q−5	13·5
11	3917	,,	,,	q−5	13·5
13	3919	90	Bh	q−1	13·1
22	3928	,,	,,	<q	<13·0
25	3931	150	Wf	q−6	13·6
26	3932	90	Bh	<q	<13·0
28	3934	157	Wf	q−6	13·6*b*
June					
2	3939	T	Bk	=q	13·0*b*
7	3944	157	Wf	q−3	13·3
8	3945	M	Ph	q−5	13·5*b*
11	3948	90	Bh	=q	13·0*b*
13	3950	,,	,,	n−5, q+3	12·7
15	3952	231	Wf	q+0·5	12·9
17	3954	90	Bh	n+2	12·0
18	3955	,,	,,	k−6, n+3	11·9
20	3957	150	Bn	n+1	12·1
22	3959	120	D	=n	12·2*b*
23	3960	M	Ph	=m, n+2	12·0
23	3960	150	Wf	=n	12·2
24	3961	T	Bk	=n, p+3, q+5	12·4*b*
24	3961	90	Bh	k−4	11·7
26	3963	120	D	l−2, m+2	11·9
27	3964	62	Wf	l−3, =m	12·0
27	3964	90	Bh	h−4, k+2	11·1*b*
30	3967	,,	,,	h−1	10·8

May 22, 26, Not seen.
May 28, Difficult.
June 22, About.

(6550) R Y OPHIUCHI—*continued.*

1924 June 30	3967	M	Ph	k (1) v (2) l, k−2	11·4*b*
July 2	3969	90	Bh	d−10, h+3	10·4
3	3970	150	Wf	h−1, k+3	10·9
4	3971	M	Ph	=h	10·7
6	3973	60	D	h−1, k+5	10·8
7	3974	62	Wf	=f, h+2	10·5
9	3976	60	D	g+2	10·4*b*
10	3977	,,	,,	e−4, f+2	10·2
10	3977	62	Wf	f+1, h+4	10·3
11	3978	50	Bn	=e	9·8
14	3981	,,	,,	d+1	9·3
19	3986	,,	,,	c−4, d+3	9·1
19	3986	T	Bk	d−1, e+1	9·6*b*
22	3989	62	Wf	d+1	9·3
24	3991	50	Bn	c−1, d+7	8·8
27	3994	62	Wf	c−3, d+4	9·0
29	3996	50	Bn	c−2, d+5	8·9
31	3998	75	,,	c−2, d+4	9·0
Aug 1	3999	62	Wf	b−10, d+3	9·2
2	4000	50	Bn	c−2, d+4	9·0
5	4003	,,	,,	c−2, d+4	9·0
5	4003	90	Bh	b (1) v (1) d	8·8
6	4004	T	Bk	b−6, d+6	8·8*b*
6	4004	62	Wf	c−3, d+3·5, e+5·5	9·1
7	4005	50	Bn	c−3, d+4	9·0
7	4005	90	Bh	b (3) v (2) d	8·9
8	4006	,,	,,	d+2	9·2
9	4007	60	D	c−5, d+3	9·2
10	4008	62	Wf	b−7, d+3	9·0
12	4010	50	Bn	c−4, d+3	9·1
15	4013	90	Bh	d−1	9·5
17	4015	60	D	d+1	9·3
19	4017	50	Bn	d+1	9·3
19	4017	90	Bh	e−4, h+5	10·2
22	4020	,,	,,	h+2	10·5
22	4020	62	Wf	e−3, f+3	10·1
22	4020	45	Br	e−2, f+4	10·0
25	4023	75	Bn	f+3	10·1
26	4024	157	Wf	h−1, k+3	10·9
27	4025	90	Bh	=h	10·7
31	4029	45	,,	h−3, k+3	11·0*b*
31	4029	62	Wf	h−3, k+2	11·1
31	4029	75	Bn	h (1) v (1) k	11·0
Sept 2	4031	90	Bh	k+1	11·2
Sept 1924 5	4034	90	Bh	k−2	11·5
7	4036	157	Wf	k−3, l+2	11·6
9	4038	120	Bn	l (2) v (1) m	11·9
12	4041	90	Bh	k−5	11·8
16	4045	,,	,,	=m, =n	12·1
23	4052	,,	,,	<n	<12·2
26	4055	150	,,	<q	<13·0
26	4055	157	Wf	q−0·5	13·0
27	4056	120	Br	q−1	13·1*b*
28	4057	T	Bk	n−3, q+2	12·7*b*
Oct 1	4060	90	Bh	q−3	13·3
5	4064	157	Wf	q−3	13·3
11	4070	120	Br	q+2	12·8*b*
13	4072	150	Bh	q−3	13·3
16	4075	157	Wf	q−6	13·6
16	4075	150	Bk	q−4	13·4*b*
22	4081	,,	Ba	q−4	13·4*b*
23	4082	90	Bh	o−2	12·7
24	4083	,,	,,	n−2, o+2	12·4
24	4083	120	Br	q−2	13·2
30	4089	90	Bh	=m	12·0*b*
Nov 3	4093	,,	,,	k−2	11·5*b*
3	4093	120	Br	o−1	12·6
4	4094	,,	Bn	<n	<12·0
8	4098	90	Bh	=k	11·3
10	4100	,,	,,	h (1) v (1) k	11·0
15	4105	,,	,,	h+2	10·5
17	4107	50	Bn	e−4, f+2	10·2
24	4114	90	Bh	d+2	9·2
27	4117	50	Bn	c−5, d+2	9·2
29	4119	45	Bh	b (1) v (1) d	8·8*b*
Dec 6	4126	,,	,,	b−1	8·3*b*
9	4129	50	Bn	a−5, b+1	8·1
10	4130	34	Li	a (7) v (3) b	8·0
13	4133	45	Bh	a (1) v (1) b	7·9*b*
14	4134	,,	,,	a (1) v (2) b	7·8
14	4134	50	Bn	a−5, b+1	8·1
19	4139	45	Bh	a−1	7·7
22	4142	,,	,,	=a	7·6*b*
25	4145	,,	,,	a−1	7·7
27	4147	,,	,,	=a	7·6*b*

Aug. 9, 5^{c}.

Sept. 23, 26, Bh, Not seen.
Sept. 27, Oct. 11, About.
Dec. 19, 25, Yellow.
Dec. 22, 27, Orange.

(2100) U ORIONIS. (V. 4.)

H.D. 054920.

Hagen's 41, which has occasionally been used as a comparison star, is the Variable U W Orionis. The comparisons therefore made with it, though duly recorded, have been neglected in deducing magnitudes.

Date.	Julian Date.	Inst.	Observer.	Comparisons.	Deduced Mag.
1920 Jan					
1	2325	90	Bh	41−5	...
8	2332	157	Th	55+5	11·1*b*
8	2332	90	Hw	41 (5) 39 (5) v	...
8	2332	75	Bg	45−3, 57+1·5	11·5
13	2337	90	Bh	41−6, 39−2, 52+6	10·8
15	2339	,,	,,	39−5, 62+5	11·1
15	2339	160	Br	49−1	11·4
19	2343	183	Ma	41 (2) v (1) 107, 41−10	...
21	2345	,,	,,	41−10	...
21	2345	90	Bh	39−6, 62+3	11·2
21	2345	142	Bg	=57	11·6
24	2348	120	Bn	55 (2) v (1) 68	11·8
24	2348	90	Bh	=57, =62	11·6
24	2348	183	Ma	107+5	12·2
26	2350	160	Br	49−2, 55+2	11·4
31	2355	90	Bh	57−1, 62−2	11·8
Feb					
4	2359	,,	,,	55−5, 62−5	12·1*b*
7	2362	75	Bg	77−1, 99+2	12·1
7	2362	90	Bh	55−5, 62−3	12·0
11	2366	150	,,	62−2, 55−4, 57−2	11·9
11	2366	157	Th	82+2	11·9*b*
13	2368	90	Bh	62−3	11·9
14	2369	75	Bg	77−1, 99+2	12·1*b*
17	2372	120	Br	55−1	11·7
17	2372	150	Bn	83 (1) v (4) 107	12·3
17	2372	90	Bh	55−3, 83+3	11·9
17	2372	183	Ma	107+5	12·2*b*
18	2373	,,	,,	41 (9) v (1) 107, 41−10	...
18	2373	55	Bg	57−2, 77+1	11·9
23	2378	183	Ma	107+5	12·2
23	2378	90	Bh	55−1, 83+1	12·1
24	2379	110	Bg	57−1, 77+2	11·8*b*
Mar					
7	2391	90	Bh	=82, =83	12·1
8	2392	,,	,,	62−4, 83+2	12·0
8	2392	150	Bn	83 (1) v (1) 107	12·4
8	2392	183	Ma	107+4	12·3
9	2393	157	Th	=83	12·2
11	2395	160	Br	55−1	11·7
11	2395	90	Bh	55−2, 62−3	11·8
11	2395	183	Ma	41 (4) v (1) 107, 107+5	12·2
12	2396	75	Bg	45−4, 57+1	11·6
13	2397	183	Ma	41 (6) v (1) 107	...
17	2401	90	Bh	62−1	11·7
18	2402	200	Bn	62 (2) v (1) 83	12·0
21	2405	90	Bh	=62, =55	11·6*b*
1920 Mar					
22	2406	90	Bh	62+2, 55+2	11·4
22	2406	75	Bg	45−3, 57+2	11·5
22	2406	90	Hw	=49	11·3*b*
22	2406	150	Bn	62 (3) v (1) 83	12·0
23	2407	160	Br	49−2	11·5
23	2407	183	Ma	41 (14) v (1) 107, 99+8	11·5
31	2415	90	Bh	41−10, 39−5	11·1
Apr					
10	2425	,,	,,	41−8, 39−2	10·8
12	2427	55	Bg	=39	10·6*c*
13	2428	183	Ma	41−5	...
16	2431	160	Br	39−1	10·7
16	2431	90	Bh	=41	...
21	2436	,,	,,	41−1	...
21	2436	157	Th	39−2	10·8*b*
21	2436	79	Ma	41−3	...*c*
27	2442	90	Bh	41−1	...
29	2444	120	Br	31−2, 39+5	10·1
May					
4	2449	90	Bh	=30, =34	10·0*b*
7	2452	,,	,,	11−4, =13, =14	9·2*b*
9	2454	120	Br	29−1	10·0*b*
12	2457	90	Bh	11−1, 14+1	9·0*b*
21	2466	,,	,,	5−6, 11+2	8·6*b*
July					
10	2516	45	,,	2−3, 3+5	6·1*c*
15	2521	,,	,,	=2	5·8*b*
30	2536	,,	,,	2−2, 3+6	6·0
Aug					
13	2550	,,	,,	2−4, 3+4	6·2
18	2555	,,	,,	2−4, 3+4	6·2
26	2563	30	Bn	e (5) v (1) 3	6·5
29	2566	90	Bh	3−2, 4+4	6·8
Sept					
4	2572	,,	,,	4+5, 5+10	6·8
10	2578	,,	,,	4+2, 5+8	7·0
12	2580	30	Bn	g−1, 4+1	7·1
13	2581	45	Bh	4+1, 5+6	7·2
16	2584	90	,,	4+1	7·1
22	2590	,,	,,	=4	7·2
25	2593	45	,,	=4	7·2
28	2596	,,	,,	4−2, 5+5	7·4*b*
29	2597	,,	Br	4−4, 5+4	7·5*b*
Oct					
1	2599	,,	Bh	4−2, 5+4	7·4
2	2600	90	,,	4−2, 5+4	7·4
6	2604	,,	,,	4−3, 5+3	7·5
6	2604	45	Br	5−1	8·0*b*

Jan. 21, Ma, 107 not seen.
Feb. 18, Ma, About.

May 9, Difficult.
Sept. 4, 16, Orange.
Sept. 22, Pale yellow.

(2100) U ORIONIS—*continued.*

1920					
Oct					
18	2616	90	Bh	4−3, 5+3	7·5
22	2620	45	,,	=5	7·9
25	2623	90	,,	5−3, 11+7	8·2
25	2623	50	Bn	5 (1) v (3) 8	8·0
29	2627	90	Bh	5−6, 11+4	8·5
Nov					
1	2630	45	,,	5−5, 11+5	8·4*b*
5	2634	90	,,	5−7, 11+3	8·6
7	2636	50	Bn	7 (3) v (1) 9	8·6
8	2637	90	Bh	5−6, 11+3	8·5
11	2640	45	Br	11+3	8·6
11	2640	50	Ma	=11	8·9
15	2644	45	Bh	11+2	8·7
18	2647	183	Ma	11+2	8·7
19	2648	75	Bg	11−1, 14+2	9·0*b*
20	2649	45	Bh	=11	8·9
21	2650	50	Bn	11 (1) v (2) 15	8·9
30	2659	90	Bh	=11	8·9*b*
Dec					
3	2662	55	Bg	14−4, 29+3	9·6
8	2667	90	Bh	11−1	9·0*b*
9	2668	160	Br	=21	9·7
10	2669	183	Ma	11 (1) v (1) 41	...
10	2669	90	Bh	11−2	9·1
17	2676	,,	,,	11−4	9·3
21	2680	,,	,,	11−6, 41+7	9·5
28	2687	79	Ma	41+1·5	...
28	2687	75	Bg	29−2, 41+1	10·1
30	2689	160	Br	39+1	10·5
31	2690	90	Bh	11−7, 21+1, 29+3	9·6
1921					
Jan					
4	2694	32	Ca	35−4, 49+8	10·5
6	2696	90	Bh	41+3	...
13	2703	,,	,,	41+3	...
14	2704	160	Br	39−2	10·8
15	2705	120	Bn	39 (2) v (1) 45	11·0
21	2711	90	Bh	=41	...
30	2720	,,	,,	41−5	...
31	2721	80	Ca	=49	11·3*b*
Feb					
1	2722	120	Bn	45 (1) v (1) 55	11·4
2	2723	75	Bg	45−3, 57+2	11·5*b*
2	2723	90	Bh	41−6, 44+2	10·8
2	2723	,,	Hw	=45	11·2*b*
2	2723	183	Ma	41−6·5	...
3	2724	160	Br	39−5, 49+3	11·0
5	2726	183	Ma	41−10	...*b*
9	2730	,,	,,	41 (3) v (1) 107, 107+10	11·7
9	2730	90	Bh	41−8, 52+5	10·9
14	2735	183	Ma	49−1	11·4
16	2737	90	Bh	=45, 62+4	11·2
20	2741	,,	,,	45−3, 62+2, 55+2	11·4*b*
24	2745	75	Bg	45−3, 57+2	11·5
25	2746	120	Br	49−2, 55+2	11·4
25	2746	90	Bh	=62, =55	11·6
26	2747	120	Bn	45 (3) v (1) 55	11·5
26	2747	183	Ma	39−8	11·4
Mar					
1	2750	80	Ca	=99	12·3
2	2751	183	Ma	39 (3) v (1) 83	11·8
1921					
Mar					
2	2751	90	Hw	49 (5) v (5) 77	11·6*b*
2	2751	120	Bn	45 (5) v (2) 55	11·5
2	2751	75	Bg	45−2, 57+3	11·4
2	2751	90	Bh	=62, =55	11·6
7	2756	,,	,,	52−3, 62−1, 55−1	11·7
7	2756	183	Ma	55+2	11·4
7	2756	90	Hw	=45	11·2*b*
10	2759	,,	,,	49 (5) v (5) 77	11·6
10	2759	,,	Bh	62−2, 55−2	11·8
11	2760	75	Bg	45−1, 57+4	11·3*b*
12	2761	80	Ca	55−6, 99+1	12·2
14	2763	183	Ma	49−1, 55+3	11·3
17	2766	90	Bh	62−2, 55−2	11·8
20	2769	160	Br	49−1	11·4
24	2773	75	Bg	=45	11·2
24	2773	90	Bh	=62, =55	11·6
24	2773	,,	Hw	45 (5) v (5) 49	11·2*b*
24	2773	183	Ma	39−2	10·8
26	2775	,,	,,	39−2	10·8
26	2775	80	Ca	55−2, 99+5	11·8
29	2778	90	Bh	45−3, =52	11·5
30	2779	79	Ma	25−3, 39+1	10·3
30	2779	75	Bg	39−5, 45+1	11·1
31	2780	120	Bn	39 (4) v (1) 45	11·0
Apr					
1	2781	90	Hw	41 (5) v (5) 39	...
1	2781	,,	Bh	62+2, 55+2	11·4
3	2783	80	Ca	49−1, 55+2	11·4
3	2783	79	Ma	=39	10·6
5	2785	,,	,,	41−4, =39	10·6
6	2786	120	Bn	45+1	11·1
7	2787	55	Bg	=39	10·6
7	2787	90	Bh	=43, =45	11·1
8	2788	160	Br	39−1	10·7
8	2788	79	Ma	41−3·5, 39+1	10·5
12	2792	90	Bh	41−3	...
15	2795	,,	,,	41−1	...
23	2803	,,	,,	21+1, 41+6	9·6
26	2806	,,	,,	11−5, 21+2	9·4
27	2807	80	Ca	29−2, 36+1	10·1*b*
28	2808	75	Bg	29−1, 41+2	10·0*b*
28	2808	160	Br	31+2	9·7*b*
30	2810	90	Bh	11−3, =14	9·2
May					
4	2814	32	Ca	=28	9·8*b*
7	2817	90	Bh	11+1	8·8*b*
8	2818	160	Br	11−4	9·3*b*
9	2819	45	Bh	5−6, 9+2, 11+4, 15+6	8·4
July					
18	2889	,,	,,	1−8, 2+4	5·4
26	2897	,,	,,	1−8, 2+5	5·3
29	2900	,,	,,	1−8, 2+5	5·3
Aug					
15	2917	,,	,,	2+2, 3+8	5·6
16	2918	,,	,,	=2	5·8
19	2921	,,	,,	2+1	5·7
30	2932	,,	,,	2−5, 3+3	6·3
Sept					
4	2937	32	Ca	3−1, 4+5	6·7
5	2938	45	Bh	=3	6·6
5	2938	30	Bn	e (5) v (2) 3	6·4

Nov. 11, Ma, About.
Dec. 10, Ma, Difficult. Bh, Orange.
Dec. 28, Ma, Bad conditions.
Jan. 15, t.
April 6, t.
May 8, About. Very difficult.
Aug. 19, Yellow.
Sept. 5, Bh, Pale yellow.

(2100) U ORIONIS—*continued.*

1921 Sept					
7	2940	30	Bn	e (1) v (1) 3	6·3
25	2958	45	Br	3+1	6·5*b*
27	2960	50	Bn	3 (1) v (3) g	6·7
30	2963	90	Bh	3−4, 4+2	7·0
30	2963	30	D	4+1	7·1*b*
Oct					
5	2968	90	Bh	4+1	7·1
6	2969	48	Bg	5−1, 6+3	8·0
6	2969	50	Bn	g (3) v (1) h	7·5
7	2970	32	Ca	4−1, 5+3	7·4
8	2971	90	Bh	4+1	7·1
14	2977	160	Br	4−1	7·3
16	2979	55	Bg	5−1, 6+3	8·0*b*
17	2980	90	Bh	=4	7·2
24	2987	,,	,,	5−1	8·0
27	2990	32	Ca	6−1, 10+4	8·3
31	2994	,,	,,	=6, 10+2	8·4
Nov					
6	3000	45	Br	4−3, 5+3	7·5
6	3000	55	Bg	7−2, 12+2	8·7
6	3000	50	Bn	6 (2) v (1) 7	8·4
7	3001	45	Bh	5−5, 11+5	8·4
7	3001	79	Ma	11+7	8·2
10	3004	50	Bn	6 (2) v (1) 7	8·4
12	3006	90	Bh	11+3	8·6
20	3014	32	Ca	=11, =15	8·9
23	3017	55	Bg	11−2, 14+1	9·1
23	3017	90	Bh	11+1	8·8
23	3017	79	Ma	11+1·5	8·7*b*
26	3020	50	Bn	11 (1) v (1) 14	9·0
27	3021	160	Br	11−1	9·0
29	3023	90	Bh	=11	8·9
Dec					
3	3027	,,	,,	=11	8·9
17	3041	55	Bg	=29	9·9*b*
20	3044	90	Bh	11−3	9·2
22	3046	75	Bg	21−4, 39+5, =41	10·1*b*
22	3046	120	Bn	41+1	...
23	3047	160	Br	31+3	9·6
25	3049	90	Bh	11−4, =14	9·2
28	3052	75	Bg	=41	...*b*
29	3053	79	Ma	41+2	...
30	3054	90	Bh	11−5, 14−2	9·4
31	3055	85	Bn	41+1	...
1922 Jan					
1	3056	90	Bh	=25, =26	9·8
3	3058	160	Br	31−2, 39+4	10·1
4	3059	120	D	41−2	...
4	3059	79	Ma	41+2	...
8	3063	90	Bh	25−2, 41+2	10·0
10	3065	,,	,,	41+2	...
16	3071	79	Ma	41+2·5	...
16	3071	55	Bg	41−1, 39+3	10·3
18	3073	90	Bh	41−1	...
20	3075	,,	,,	41−1	...
20	3075	,,	Hw	=41	...
20	3075	55	Bg	39−1, 45+5	10·7
21	2076	160	Br	39−4, 49+4	10·9
29	3084	90	Bh	41−2	...*b*
Feb					
1	3087	75	Bg	39−4, 45+2	11·0
2	3088	90	Bh	41−3	...
1922 Feb					
10	3096	90	Bh	41−5	...
13	3099	,,	Hw	<39	<10·6*b*
17	3103	,,	Bh	55+2	11·4
17	3103	130	Ma	107+5	12·2
18	3104	75	Bg	57−1, 77+2	11·7
18	3104	160	Br	49−2, 55+2	11·4
18	3104	120	Bn	45 (4) v (1) 55	11·5
19	3105	130	Ma	107+5	12·2
22	3108	80	Ca	61−3, =68	11·9*b*
24	3110	130	Ma	41 (9) v (1) 107, 107+4	12·3
26	3112	120	Bn	55 (1) v (2) 83	11·8
26	3112	90	Bh	55−2, 62−1	11·7
Mar					
3	3117	80	Ca	82−1, 99+1	12·2
4	3118	75	Bg	=77	12·0
4	3118	120	Br	55−2	11·8
4	3118	90	Bh	55−3, 62−2	11·8
9	3123	130	Ma	107+3·5	12·3*b*
16	3130	90	Bh	55−5	12·1
18	3132	130	Ma	107+3	12·4*b*
19	3133	90	Bh	55−7	12·3
19	3133	160	Ca	82−2, 99+1	12·2
20	3134	130	Ma	107+5	12·2*b*
20	3134	120	Bn	55 (2) v (1) 83	12·0
22	3136	90	Bh	55−5, 62−5	12·1
23	3137	130	Ma	99+6, 107+5	11·9
25	3139	120	Br	55−2, 83+4	11·8
28	3142	,,	Bn	55 (2) v (1) 83	12·0
28	3142	90	Bh	62−5	12·1
30	3144	80	Ca	82−1, 99+2	12·1
31	3145	150	Bh	55−5, 62−5, =82, =83	12·1
Apr					
2	3147	75	Bg	<77	<12·0*b*
14	3159	80	Ca	=77, 82+1	12·0
14	3159	90	Bh	41−10, 55+4	11·2*b*
17	3162	,,	,,	41−7, 55+7	10·9*b*
19	3164	75	Bg	=57	11·6*b*
19	3164	85	Bn	45 (2) v (1) 55	11·4
29	3174	120	Br	=49	11·3*b*
29	3174	90	Bh	41−2	...
May					
5	3180	,,	,,	41+1	...
6	3181	,,	,,	=41	...
July					
10	3246	45	,,	2−5, 3+3	6·3*b*
27	3263	,,	,,	=2	5·8
31	3267	,,	,,	1−10, 2+2	5·6
Aug					
5	3272	,,	,,	1−8, 2+2	5·5
12	3279	,,	,,	1−8, 2+4	5·4
17	3284	,,	,,	=2	5·8*b*
19	3286	,,	,,	1−10, 2+2	5·6
23	3290	30	Bn	e (1) v (2) 3	6·2
25	3292	45	Bh	2+1	5·7
29	3296	B	Ca	2 (2) v (6) 3	6·0
31	3298	45	Bh	2+1	5·7
Sept					
9	3307	,,	,,	=2	5·8
15	3313	,,	,,	2−4, 3+4	6·2*b*
21	3319	90	,,	3+1	6·5
26	3324	45	,,	=3	6·6*b*

Sept. 30, D. Difficult.
Nov. 7, Ma, Pale orange.
Jan. 16, Ma, Red.

Mar. 9, Just glimpsed.
April 19, Bg, About.
April 29, Br, About. Difficult.

(2100) U ORIONIS—*continued.*

1922					
Sept					
28	3326	32	Ca	3 (3) v (2) 4	7·0
29	3327	45	Br	3−4, 4+2	7·0*b*
Oct					
1	3329	,,	Bh	3−2, 4+3	6·8
13	3341	48	Bg	5−1, 6+3	8·0*b*
14	3342	45	Bh	3−5, 4+1	7·1*b*
15	3343	37	Lp	4 (1) v (2) 5	7·4
19	3347	32	Ca	5 (1) v (3) 6	8·0
21	3349	90	Bh	4−4, 5+3	7·6
24	3352	37	Lp	=5	7·9
25	3353	90	Bh	=5	7·9
25	3353	50	Bn	h (3) v (1) k	7·9
27	3355	45	Br	4+1	7·1
28	3356	37	Lp	8 (2) v (2) 9	8·5
28	3356	34	Li	4 (4) v (6) 5	7·5
Nov					
1	3360	,,	,,	4 (3) v (7) 5	7·4
1	3360	37	Lp	=9	8·6*b*
1	3360	50	Bn	6 (2) v (1) 7	8·4
1	3360	55	Bg	7−1, 9+1	8·5*b*
4	3363	90	Bh	5−4, 11+4	8·4
6	3365	48	Bg	7−3, 11+1·5	8·7
9	3368	90	Bh	5−5, 11+3	8·5
11	3370	,,	,,	11+2	8·7
11	3370	45	Br	5−3, 7+3	8·2
11	3370	37	Lp	=11	8·9*b*
13	3372	32	Ca	10 (1) v (1) 11	8·8
15	3374	50	Bn	10 (1) v (1) 11	8·8
18	3377	37	Lp	=11	8·9
19	3378	90	Bh	=11	8·9
24	3383	,,	,,	11−1	9·0
24	3383	75	Bg	11−1·5, 14+1·5	9·0*b*
24	3383	160	Br	11−3, 20+3	9·2
24	3383	100	Lp	11 (2) v (2) 14	9·0
25	3384	50	Bn	11 (2) v (1) 15	9·0
28	3387	90	Bh	11−2, 14+1	9·1
Dec					
4	3393	,,	,,	=13, =14	9·2
6	3395	,,	,,	=13, =14	9·2
6	3395	150	Lp	15 (2) v (2) 25, =21	9·5*b*
7	3396	32	Ca	21 (1) v (1) 29	9·8
8	3397	50	Bn	14 (1) v (3) 20	9·3
11	3400	90	Bh	11−4, 14−1, 21+4	9·3
16	3405	,,	,,	13−1, =14, 21+4	9·2
16	3405	100	Lp	25 (2) v (2) 29	9·8*b*
19	3408	160	Br	21−1, 31+1	9·8
19	3408	90	Bh	14−3, 21+2	9·5*b*
20	3409	100	Lp	=29	9·9
22	3411	55	Bg	21−2, =29	9·9*b*
23	3412	100	Lp	=31	9·9
26	3415	,,	,,	29 (2) v (2) 41	...
26	3415	85	Bn	29 (2) v (1) 41	...
28	2417	90	Bh	=21, =25	9·7
1923					
Jan					
4	3424	,,	,,	21−3, 25−2	10·0
5	3425	80	Ca	25 (1) v (1) 32	9·9
5	3425	,,	Ry	21−3·5, 39+1·5	10·2
6	3426	100	Lp	=41	...
6	3426	90	Bh	21−4	10·1
8	3428	...	Sa	11−10, 15−8, 41+4	9·8
10	3430	75	Bg	41−1, 39+3	10·3
11	3431	90	Bh	25−5	10·3
12	3432	150	Lp	41−1	...*b*

Oct. 15, Golden yellow.
Jan. 5, Ry, Observer enters instrument as t.

1923					
Jan					
14	3434	100	Lp	41 (1) v (2) 48	...
14	3434	75	Bn	=39	10·6
14	3434	90	Bh	21−8, 25−6	10·4
16	3436	40	Ry	=39	10·6*b*
16	3436	100	Lp	41 (1) v (2) 48	...
20	3440	90	Bh	25−8, 39−2	10·7*b*
20	3440	160	Br	=39	10·6
21	3441	...	Sa	41−3, =39, 62+10	10·6
22	3442	75	Bg	39−1, 45+5	10·7
23	3443	100	Lp	41 (1) v (4) 48, 41−2	...*b*
23	3443	90	Hw	=41	...
Feb					
3	3454	,,	Bh	21−7, 25−5	10·3
4	3455	150	Lp	=48	11·3*b*
5	3456	120	Bn	45−1	11·3
5	3456	40	Hw	=39	10·6*b*
5	3456	94	Li	41 (2) v (8) 45	...
7	3458	80	Ca	62−1, =58	11·7
8	3459	...	Sa	39−3, 43+3	10·8
8	3459	160	Br	49+1	11·2
8	3459	90	Bh	21−10, 39−5	10·9*b*
17	3468	,,	,,	55+5	11·1
18	3469	55	Bg	45−1, 57+3	11·3
21	3472	150	Lp	=57	11·6*b*
27	3478	,,	Bh	55+3	11·3
Mar					
2	3481	90	,,	=55	11·6*b*
5	3484	,,	,,	=62, =55	11·6
5	3484	130	Ma	107+5	12·2
9	3488	32	Ca	62 (2) v (3) 82	11·8
13	3492	90	Bh	62−2	11·8
17	3496	150	,,	62−5, 55−5	12·1
17	3496	75	Bg	57−1, 77+2	11·8
18	3497	130	Ma	41 (6) v (1) 107	...
Apr					
6	3516	80	Ca	50 (1) v (1) 62	11·5
8	3518	75	Bg	=77	12·0
8	3518	120	Bn	45−6, 55−1	11·7
9	3519	,,	,,	55−2	11·8
13	3523	90	Bh	62−3	11·9
14	3524	130	Ma	41−2, 107+10	11·7*b*
14	3524	75	Bg	57−3, =77	12·0*b*
20	3530	90	Bh	39−10	11·6
27	3537	,,	,,	62+2, 55+2	11·4
May					
4	3544	40	Ry	21−3, 29−3, 39+2	10·2*b*
5	3545	90	Bh	62+4, 55+4	11·2
10	3550	,,	,,	21−10, 55+10	10·6*b*
16	3556	45	,,	21−5	10·2*b*
July					
20	3621	,,	,,	3−3, 4+3	6·9
30	3631	,,	,,	3+1	6·5
Aug					
4	3636	,,	,,	2−6, 3+3	6·4
9	3641	45	Bh	2−5	6·3
11	3643	20	Ry	3−1	6·7*b*
15	3647	...	Sa	1−12, 2−3, 3+4, 4+7	6·1
15	3647	45	Bh	2−3, 3+5	6·1
22	3654	,,	,,	2−3	6·1
26	3658	20	Ry	e−11, 3−1·5, g+2	6·9
28	3660	...	Sa	2−10, 3−3, 4+5	6·8
30	3662	45	Bh	2−5, 3+3	6·3

April 8, 9, Bn, t.
Aug. 11, t.
Aug. 22, Yellow.
Aug. 26, t. Reddish-orange.

(2100) U ORIONIS—*continued.*

1923 Sept					
2	3665	45	Bh	2−4, 3+4	6·2*b*
6	3669	,,	,,	3+1	6·5
6	3669	30	Ry	e−10, 3−4, g+1, 6+4	7·2
7	3670	...	Sa	2−9, =3, 4+5, 5+8	6·8
7	3670	37	Lp	3 (2) v (1) 4	7·0*c*
8	3671	45	Bh	3+1	6·5
10	3673	,,	,,	3+1	6·5
11	3674	25	Bn	3 (1) v (1) g	6·8
15	3678	...	Sa	2−8, =3, 4+3, 5+8	6·8
15	3678	45	Bh	=3	6·6
18	3681	37	Lp	=4	7·2*c*
23	3686	50	Bn	g (2) v (1) h	7·4
26	3689	45	Bh	3−3, 4+3	6·9
Oct					
1	3694	,,	,,	4+2	7·0*b*
4	3697	90	,,	4+2, 5+7	7·1
7	3700	,,	,,	4+1	7·1
11	3704	...	Sa	4−2, 5+4	7·4
11	3704	90	Bh	4+1	7·1
11	3704	45	Br	3−5, 4+2	7·0
13	3706	32	Ca	=5	7·9
13	3706	37	Lp	4 (2) v (2) 5	7·5*b*
14	3707	50	Bn	4−2, 5+5	7·4
17	3710	60	D	5 (1) v (2) 11, 5−3	8·2
17	3710	90	Bh	5+2	7·7
20	3713	,,	,,	=5	7·9
22	3715	37	Lp	8 (2) v (2) 9	8·5*b*
22	3715	55	Bg	5 (1) v (2) 6	8·0*b*
23	3716	90	Bh	4−3, =5	7·7*b*
24	3717	30	Ry	5−3, 11+5	8·3*b*
25	3718	45	Bh	4−1	7·3*b*
26	3719	90	,,	4−2	7·4
31	3724	,,	,,	4−3, 5+3	7·5
Nov					
2	3726	32	Ca	=6	8·3
3	3727	30	Ry	=7, 8−2, 11+3	8·5*b*
3	3727	90	Bh	4−6, 5+1	7·8
3	3727	100	Lp	=9	8·6*b*
4	3728	55	Bg	6 (1) v (1) 7	8·4*b*
4	3728	45	Br	4−3, 5+3	7·5
6	3730	...	Sa	=5, 8+2	8·1
6	3730	45	Bh	4−5, 5+1	7·7
7	3731	50	Bn	5 (1) v (1) 8	8·2
7	3731	30	D	5 (4) v (1) 11, 11+2	8·7
8	3732	,,	Ry	7+1, 8−2, 11+3	8·5
9	3733	90	Bh	=5	7·9
10	3734	30	D	5 (4) v (1) 11, 11+2	8·7
14	3738	100	Lp	11+2	8·7*b*
15	3739	50	Ry	=11	8·9
16	3740	55	Bg	7 (3) v (1) 9	8·6
17	3741	90	Bh	5−6, 11+4	8·5
18	3742	50	Bn	5 (2) v (3) 8	8·1
18	3742	100	Lp	=11	8·9*b*
23	3747	90	Bh	5−9, 11+1	8·8
24	3748	...	Sa	5−5, 8−3, 11+3, 14+6	8·6
28	3752	32	Ca	10 (1) v (1) 11	8·8
28	3752	30	Ry	11−1·5	9·0*b*
30	3754	90	Bh	=11	8·9

Oct. 11, 20, 23, Nov. 3, Bh, Orange.
Sept. 6, Oct. 24, Nov. 3, 8, 28, Ry, t.
Nov. 9, 17, Yellow.
Nov. 15, T.

1923 Dec					
2	3756	90	Bh	11+2	8·7
2	3756	55	Bg	11 (1) v (3) 14	9·0
3	3757	160	Br	=11	8·9
4	3758	90	Bh	=11	8·9
4	3758	100	Lp	11 (2) v (2) 14	9·0*b*
4	3758	40	Hw	=11	8·9*b*
5	3759	79	Ma	=9, 11+2, 14+2	8·8
6	3760	...	Sa	11−4, =21, 29+2	9·5
6	3760	30	Ry	11−4, =15	9·1*b*
8	3762	90	Bh	11+1	8·8
9	3763	55	Bg	11 (3) v (1) 14	9·1
9	3763	100	Lp	=14	9·2
9	3763	60	D	=14	9·2
11	3765	80	Ry	15−1, 14+1, 29+2	9·3*b*
12	3766	32	Ca	11 (1) v (2) 14	9·0
15	3769	100	Lp	15 (2) v (2) 21, =14	9·3*b*
15	3769	50	Bn	11 (2) v (1) 14	9·1
16	3770	55	Bg	14 (1) v (2) 21	9·3
17	3771	50	Ry	11−7, 14−1·5, 29+4, 31+8	9·4
18	3772	90	Bh	11−1	9·0
18	3772	,,	Sa	11−3, =14, 21+3, 29+6	9·2
19	3773	64	,,	11−3, 14−1, 21+2, 29+3	9·4
24	3778	90	Bh	11−2, =13	9·1
27	3781	50	Ry	14−3, =29, 31+2	9·7*b*
28	3782	64	Sa	14−4, 20−1, =29, 35+3	9·7
30	3784	120	D	=29	9·9
31	3785	32	Ca	25 (2) v (1) 35	10·0
1924					
Jan					
2	3787	80	Ry	14−4, 29−4, 31+1, 39+5	9·9
2	3787	100	Lp	29 (2) v (2) 39, =31	10·1*b*
3	3788	75	Bg	=29	9·9
3	3788	34	Sa	21−3, 29−1, 41+4	10·0
3	3788	160	Br	21−1, 29+1	9·8
3	3788	90	Bh	11−1	9·0
5	3790	,,	,,	11−4	9·3
6	3791	50	Bn	14 (2) v (1) 20	9·4
6	3791	100	Lp	=31	9·9*b*
7	3792	60	D	21−2, 29+1	9·8
11	3796	80	Ry	29−5, =31, 39+5	10·1
12	3797	,,	D	41+2	...
16	3801	90	Bh	11−5	9·4
25	3810	,,	,,	11−7, 25+2	9·6
25	3810	160	Br	31−5, 39+2	10·4
25	3810	134	Sa	41−2, 39+2	10·4
25	3810	100	Lp	39 (1) v (4) 48	10·7*b*
25	3810	90	Hw	25 (5) v (5) 39	10·2*b*
27	3812	75	Bg	=39	10·6
27	3812	120	Bn	35 (3) v (1) 39	10·5
27	3812	80	Ry	39+1, 45+2	10·7*b*
28	3813	120	D	41−3	...
29	3814	64	Sa	41−2, =39, 49+5	10·7
31	3816	90	Bh	21−2	9·9
Feb					
1	3817	32	Ca	39 (1) v (4) 43	10·7

Dec. 5, Pale red.
Dec. 6, Ry, t.
Dec. 17, T.
Dec. 27, t.
Jan. 6, Lp, Difficult.
Jan. 12 7^{c}.

(2100) U ORIONIS—*continued.*

1924						1924					
Feb						Apr					
1	3817	120	Bn	39 (2) v (1) 45	11·0	14	3890	134	Sa	=49	11·3
1	3817	75	Bg	39 (1) v (3) 45	10·7	16	3892	90	Bh	39 (3) v (1) 57	11·4
3	3819	100	Lp	40 (1) v (2) 48	10·8	24	3900	80	Ry	45−2, 55+4	11·3
7	3823	80	Ry	39−2, 45+2	10·9	25	3901	90	Bh	=62, =57	11·6
8	3824	40	Hw	=39	10·6*b*	30	3906	,,	,,	=57	11·6
11	3827	90	Bh	11−10, 21−5, 25−2	10·0*b*	May					
16	3832	,,	Sa	29−5, 41−2	10·4	2	3908	80	Ry	39−2, 44+4	11·7*b*
20	3836	80	Ca	39 (6) v (4) 62	11·2	3	3909	90	Bh	=57	11·6
21	3837	90	Bh	=39	10·6	5	3911	,,	,,	=57	11·6*b*
23	3839	80	D	29 (4) v (1) 45, 45+2	10·9	5	3911	134	Sa	39−5	11·1*b*
						9	3915	170	Ry	39−1	10·7*b*
24	3840	90	Bh	39−2	10·8	July					
25	3841	50	Ry	39−2, 45+2	10·9*b*	14	3981	45	Bh	=4, =5	7·5*b*
26	3842	90	Bh	39−2	10·8	23	3990	,,	,,	3 (1) v (2) 4	6·8*b*
28	3844	32	Ca	46 (1) v (2) 53	11·3	26	3993	,,	,,	2 (3) v (2) 4, =3	6·6*b*
28	3844	160	Br	39−4, 49+4	10·9	29	3996	,,	,,	2 (1) v (2) 4	6·3
29	3845	80	Ry	=45, 55+3	11·2	Aug					
Mar						3	4001	45	Bh	2−2	6·0
1	3846	134	Sa	=45, =49	11·2	8	4006	,,	,,	1 (3) v (2) 3, =2	5·8
1	3846	90	Bh	39−5	11·1	9	4007	20	Ry	2−2, =e, 3+3	6·1
4	3849	,,	,,	39 (1) v (2) 55	10·9	15	4013	45	Bh	2+2, 3+10	5·6
4	3849	150	Lp	48 (2) v (2) 55	11·4	19	4017	,,	,,	1 (1) v (1) 3	5·6
4	3849	120	Bn	39 (4) v (1) 45	11·0	25	4023	,,	,,	1 (1) v (1) 2, 1 (1) v (2) 3	5·2
4	3849	75	Bg	45 (1) v (2) 57	11·3						
5	3850	90	Hw	=45	11·2	25	4023	25	Ry	=2, e+4, 3+5	5·8
5	3850	...	Kw	39 (1) v (1) 62, 40−2	11·0	27	4025	45	Bh	1 (1) v (1) 2, 1 (1) v (2) 3	5·2
7	3852	90	Bh	39 (1) v (1) 55	11·1						
8	3853	32	Ca	=51	11·4	29	4027	20	Ry	c−3, 2+2	5·6
9	3854	120	D	39 (2) v (1) 55, 55+4	11·2*b*	Sept					
						2	4031	45	Bh	1 (1) v (1) 2, 1 (1) v (2) 3	5·2
9	3854	90	Bh	39 (1) v (1) 57	11·1						
9	3854	120	Bn	45 (1) v (4) 55	11·2	5	4034	,,	,,	1 (1) v (1) 2, 1 (1) v (2) 3	5·2
9	3854	75	Bg	45 (1) v (3) 57	11·3						
15	3860	90	Bh	=45	11·2*b*	8	4037	,,	,,	1 (1) v (1) 2, 1 (1) v (2) 3	5·2
16	3861	170	Ry	45+1	11·1*b*						
16	3861	...	Kw	39−5	11·1*b*	8	4037	34	Sa	1−5, 2+6	5·1
20	3865	60	,,	41−3, 45+2	11·0	9	4038	32	Ca	c (3) v (2) 2	5·6
20	3865	134	Sa	=45	11·2	12	4041	45	Bh	1 (1) v (1) 3, 2+3	5·5
22	3867	90	Bh	39−6, 45−1	11·2	16	4045	,,	,,	1 (3) v (2) 3, =2	5·8
23	3868	80	Ca	51 (1) v (1) 62	11·5	17	4046	34	Sa	1−8, 2+4	5·4*b*
23	3868	170	Ry	=45	11·2*b*	18	4047	25	Ry	2+1	5·7*b*
24	3869	75	Bg	45 (1) v (4) 57	11·3	23	4052	45	Bh	1 (3) v (2) 3	5·8
24	3869	90	Hw	=49	11·3*b*	24	4053	34	Sa	1−12, 2+3, 3+8	5·7*b*
26	3871	,,	Bh	39 (1) v (1) 62	11·1	27	4056	64	,,	1−8, 2+3	5·4
29	3874	,,	,,	39 (2) v (1) 55	11·2	27	4056	25	Ry	=e, 3+2	6·2
29	3874	100	Lp	48 (2) v (2) 55	11·4*b*	27	4056	45	Bh	2−3, 3+4	6·2
29	3874	60	Kw	41−2, =45	11·2	Oct					
30	3875	75	Bg	=45	11·2*b*	1	4060	,,	,,	1 (4) v (1) 3	6·2
30	3875	120	Bn	45 (1) v (1) 55	11·4	2	4061	37	Wb	=2	5·8
Apr						3	4062	45	Bh	1 (4) v (1) 3	6·2
4	3880	,,	,,	45 (2) v (1) 55	11·4	3	4062	32	Ca	=2	5·8
4	3880	160	Br	49+1	11·2	4	4063	25	Ry	2−1·5, e+1	5·9
4	3880	90	Bh	39 (2) v (1) 62	11·2	6	4065	34	Sa	2−1	5·9*b*
4	3880	80	Ca	53 (1) v (1) 58	11·6	6	4065	45	Bh	2 (1) v (1) 3	6·2*b*
5	3881	40	Wb	=49	11·3	8	4067	20	Ry	2−4·5, e−2, 3+1	6·3
5	3881	90	Hw	=49	11·3	11	4070	45	Bh	2 (1) v (1) 3	6·2*b*
6	3882	75	Bg	=45	11·2*b*	12	4071	37	Wb	2 (2) v (3) 3	6·1
6	3882	170	Ry	45−4, 55+3	11·4*b*	13	4072	45	Bh	=2	5·8
6	3882	60	Kw	41 (1) v (1) 55, =49	11·3	15	4074	,,	,,	2 (1) v (2) 3	6·1
7	3883	,,	,,	45−3, =58	11·6	19	4078	17	Ry	3−1, 4+5	6·7
7	3883	120	Bn	45 (5) v (2) 55	11·5	23	4082	90	Bh	=3	6·6
8	3884	90	Bh	39 (3) v (1) 57	11·4	23	4082	45	Br	2−2	6·0

Feb. 25, t.
Mar. 5, 16, Kw, t.
Mar. 9, D, Difficult.
Mar. 20, 29, April 6, 7, Kw, T.

Aug. 9, 29, t.
Sept. 23, Oct. 3, Bh, Orange.
Oct. 8, t.
Oct. 13, Orange.

(2100) U ORIONIS—*continued.*

1924					
Oct					
23	4082	34	Li	2 (3) v (7) 3	6·0
23	4082	37	Lp	3 (1) v (2) 4	6·8
24	4083	30	Ry	3−3, 4+5	6·8
24	4083	32	Ca	=3	6·6
25	4084	55	Bg	2 (3) v (1) 4	6·8*b*
26	4085	90	Bh	=3, =4	6·9*b*
27	4086	32	Ca	3 (1) v (4) 4	6·7
31	4090	37	Wb	3 (2) v (3) 4	6·8
31	4090	45	Bh	3 (1) v (2) 4	6·8
Nov					
1	4091	34	Sa	2−6, 3−1, 4+4	6·6
2	4092	30	Ry	3−4, 4+3	6·9
2	4092	37	Wb	3 (3) v (2) 4	7·0
2	4092	32	Ca	3 (2) v (3) 4	6·8
3	4093	60	D	3−4, 4+3	6·9
3	4093	55	Bg	3 (1) v (3) 4	6·8
3	4093	50	Bn	3−5, g+1	7·0
3	4093	34	Sa	4−2, 5+4	7·4
3	4093	45	Bh	3 (1) v (2) 4	6·8
3	4093	,,	Br	=3	6·6
3	4093	34	Li	=3	6·6
4	4094	,,	,,	2 (9) v (1) 3	6·5
4	4094	75	Lp	3 (2) v (1) 4	7·0
8	4098	45	Bh	3 (3) v (1) 4	7·0
11	4101	32	Ca	3 (4) v (2) 4	7·0
15	4105	90	Bh	3 (2) v (1) 4	7·0
18	4108	30	Ry	4−4, =5	7·7
20	4110	32	Ca	4 (1) v (6) 5	7·3
24	4114	45	Bh	=4	7·2
26	4116	50	Ry	5−2·5, =7	8·3*b*
27	4117	37	Wb	5 (3) v (2) 7	8·2
28	4118	45	Bh	4 (1) v (2) 5	7·4
29	4119	32	Ca	=5	7·9

Oct. 24, Nov. 2, Ry, t.
Oct. 26, Unsteady.
Oct. 31, Wb, Very red.
Nov. 3, Br, Very orange.
Nov. 18, 26, t.

1924					
Nov					
30	4120	32	Ca	5 (1) v (3) 6, 7+5	8·0
30	4120	34	Li	4 (5) v (5) 5	7·5
30	4120	30	D	5 (2) v (3) 11, 5−4	8·3
Dec					
1	4121	90	Bh	4 (1) v (1) 5	7·5*b*
3	4123	34	Li	4 (3) v (7) 5	7·4
4	4124	90	Bh	4 (2) v (1) 5	7·6
5	4125	50	Ry	8−3, 11+2	8·7*b*
5	4125	,,	Bn	4 (6) v (1) 5, h−3	7·8
5	4125	55	Bg	=7	8·4*b*
6	4126	37	Wb	=5	7·9
9	4129	34	Li	5 (5) v (5) 6	8·1
13	4133	,,	,,	4 (8) v (2) 5	7·7
13	4133	,,	Sa	7−1, 9+1	8·5
14	4134	37	Wb	=5	7·9
14	4134	90	Bh	5 (1) v (1) 11	8·4
14	4134	75	Lp	=15	9·0*b*
14	4134	50	Bn	5 (1) v (1) 8	8·2
14	4134	55	Bg	=15	9·0
15	4135	32	Ca	=11	8·9
17	4137	50	Ry	8−2·5, 11−1	8·8
19	4139	90	Bh	5 (2) v (1) 11	8·5
22	4142	55	Bg	11 (1) v (3) 14	9·0
22	4142	60	D	=11	8·9
24	4144	90	Bh	11+1	8·8
25	4145	60	D	11−1, 14+3	8·9
26	4146	90	Bh	=11	8·9
27	4147	,,	Sa	=15, 14+2	9·0
28	4148	55	Bg	11 (1) v (1) 14	9·0
28	4148	75	Lp	=21	9·7*b*
28	4148	37	Wb	=11	8·9
28	4148	50	Ry	14−4, 29+5	9·5*b*
30	4150	,,	Bn	14 (1) v (3) 20	9·3
30	4150	75	Lp	=21	9·7
30	4150	45	Bh	=11	8·9

Nov. 30, D, 7^c.
Dec. 5, Ry, t.
Dec. 17, T.
Dec. 28, Ry, t.

(8290) R PEGASI. (V. 1.)

H.D. 230110.

Date.	Julian Date.	Inst.	Observer.	Comparisons.	Deduced Mag.
1920					
Jan					
1	2325	45	Bh	=9, 13+6	10·2
5	2329	90	,,	5−4, 9+4	9·7
5	2329	23	Bo	6 (1) v (3) 7	9·5
8	2332	,,	,,	4 (3) v (1) 5	9·2
8	2332	40	Hw	v (5) 9 (5) 13	9·3*b*
9	2333	90	Bh	3−1, 4+1	8·6
11	2335	30	Bn	4 (2) v (1) 6	9·1
13	2337	90	Bh	3−2, =4	8·7
14	2338	23	Bo	3 (1) v (2) 4	8·5
16	2340	60	Bn	f (4) v (1) 3	8·3

Date.	Julian Date.	Inst.	Observer.	Comparisons.	Deduced Mag.
1920					
Jan					
16	2340	40	Hw	=3	8·5
17	2341	90	Bh	3−1, 4+1	8·6*b*
19	2343	40	Hw	=3	8·5
19	2343	30	Bn	g (1) v (2) 3	8·2
21	2345	,,	,,	f (3) v (1) g	8·0
21	2345	50	Ma	=3	8·5
21	2345	23	Bo	2 (3) v (1) 3	8·2

Jan. 21, Ma, Pale yellow.

(8290) R PEGASI—*continued.*

1920					
Jan					
22	2346	30	D	2−6, 3+3	8·0
23	2347	45	Bh	2−9, 4+5	8·2
25	2349	90	,,	2−7, 4+7	8·0
29	2353	23	Bo	2 (1) v (4) 3	7·5
Feb					
3	2358	,,	,,	2 (1) v (3) 3	7·6
4	2359	90	Bh	2−5	7·8
6	2361	40	Hw	=2	7·3
6	2361	50	Bn	2 (1) v (3) 4	7·7
7	2362	23	Bo	=1	7·4
8	2363	30	Bn	2 (1) v (1) 1	7·3
11	2366	45	Bh	2−4, 4+10	7·7*b*
12	2367	30	D	2−6, 3+5	7·9*b*
16	2371	45	Bh	2−5, 4+9	7·8*b*
17	2372	50	Bn	2−1·5	7·5
Mar					
25	2409	45	Bh	2−7, =3, 4+7	8·2*b*
31	2415	,,	,,	2−10, =3, 4+2	8·4
Apr					
11	2426	90	,,	3−3, =4, 5+5	8·8*b*
17	2432	45	,,	4−3, 5+3, 6+3, 7+8	9·0
27	2442	,,	,,	4−7, 9+7	9·4*b*
May					
9	2454	90	,,	4−9, 9+5	9·6
12	2457	,,	,,	9+1	10·0*b*
14	2459	,,	,,	5−8, =9, 13+3	10·3
23	2468	,,	,,	9−6, 13+2	10·7
June					
2	2478	,,	,,	13−1	11·0
4	2480	45	,,	=13	10·9*b*
8	2484	90	,,	9−10, 13−3	11·2
15	2491	,,	,,	13−4	11·3*b*
18	2494	,,	,,	=15	11·3
23	2499	,,	,,	15−2, 17+2	11·5*b*
29	2505	,,	,,	13−10, 17−1	11·8
July					
10	2516	,,	,,	15−6, 25+4	12·0
18	2524	120	Bn	25+1	12·3
19	2525	90	Bh	21−2, 25+3	12·1*b*
24	2530	,,	,,	21−3, 25+1	12·3
30	2536	,,	,,	25+4	12·0*b*
Aug					
13	2550	150	,,	25−5, =31, =33	12·8
17	2554	160	Bo	27 (3) v (1) 31	12·6
23	2560	79	Ma	=y	13·1
28	2565	90	Bh	25−5	12·9
Sept					
1	2569	,,	,,	21−10, 25−5	12·9
4	2572	,,	,,	25−5, =35	12·9
8	2576	160	Bo	34 (1) v (1) 35	12·9
10	2578	79	Ma	25−3, y+2	12·8
14	2582	160	Bo	33 (1) v (1) 34	12·8
16	2584	90	Bh	25−5, =34, =35	12·9
19	2587	160	Bo	31 (1) v (3) 33	12·7
19	2587	150	Bn	25 (4) v (1) y, 31+1, 33+2	12·8
22	2590	90	Bh	21−10, 25−3	12·8*b*
27	2595	,,	,,	25−5	12·9
Oct					
1	2599	,,	,,	21−10, 25−5	12·9
4	2602	55	Bo	22 (3) v (1) 25	12·3
6	2604	90	Bh	=25	12·4
9	2607	160	Bo	22 (3) v (1) 25	12·3
11	2609	79	Ma	24−1·5	12·6
1920					
Oct					
12	2610	60	D	21−5, =25	12·4*b*
12	2610	90	Bh	21−2, 25+3	12·1
14	2612	160	Bo	24 (3) v (1) 25	12·4
17	2615	79	Ma	21 (1) v (1) 25	12·2*c*
18	2616	60	D	21−3	12·2*b*
18	2616	90	Bh	21+1, 25+6	11·8
19	2617	130	Bo	27 (1) v (1) 25	12·4
20	2618	120	Bn	21 (3) v (1) 25	12·3
22	2620	90	Bh	=21, =27	12·1*b*
29	2627	,,	,,	=21	11·9
30	2628	55	Bo	23 (1) v (3) 24	12·1
Nov					
1	2630	120	Bn	21 (5) v (2) 25	12·3
3	2632	90	Bh	21−1	12·0
4	2633	160	Bo	=21	11·9*b*
6	2635	79	Ma	=22	12·1*c*
8	2637	160	Bo	20 (1) v (1) 21	11·9
11	2640	120	Bn	21 (2) v (1) 25	12·3
11	2640	79	Ma	=22	12·1
13	2642	90	Hw	<21	<11·9
13	2642	,,	Bh	17−1, 21+1	11·8
15	2644	,,	,,	17+1	11·6
16	2645	160	Bo	20 (1) v (3) 21	11·9*b*
18	2647	90	Bh	15−2, 17+1	11·6
Dec					
1	2660	55	Bo	19 (1) v (3) 20	11·8
3	2662	79	Ma	13 (3) v (1) 27	11·9
3	2662	90	Bh	13−3, =15, 17+3	11·3*b*
8	2667	,,	,,	13−2, 17+4	11·2
9	2668	120	Bn	17 (2) v (1) 21	11·8
11	2670	90	Bh	15−3, 17−1	11·7*c*
12	2671	,,	,,	13−3, 15+1, 17+4	11·2
21	2680	,,	,,	=13	10·9
22	2681	55	Bo	13 (1) v (3) 15	11·0
25	2684	90	Bh	9−6, 13+2	10·7
28	2687	,,	,,	9−4	10·5
28	2687	75	Bn	13+1	10·8
28	2687	40	Hw	=13	10·9*b*
31	2690	90	Bh	9−1	10·2
1921					
Jan					
2	2692	,,	,,	=9	10·1
7	2697	,,	,,	9+1	10·0
9	2699	,,	,,	9+2	9·9
12	2702	50	Ma	9+1	10·0
12	2702	30	Bn	9 (1) v (3) q	10·2
14	2704	55	Bo	8 (3) v (1) 9	10·0
14	2704	90	Bh	5−2, 9+6	9·5*b*
15	2705	,,	Hw	=7	9·8
16	2706	60	D	3 (4) v (1) 9, 9+3	9·8*b*
24	2714	45	Bh	=4	8·7*b*
30	2720	,,	,,	=3	8·5
30	2720	30	D	4−3	9·0*b*
31	2721	50	Bn	3 (2) v (1) 4	8·6*b*
Feb					
2	2723	90	Bh	3+1, 4+4	8·3
2	2723	,,	Hw	v (3) 3 (7) 4	8·3
9	2730	,,	Bh	2−7, 4+7	8·0
14	2735	45	,,	2−7, 4+7	8·0*b*
Mar					
6	2755	,,	,,	2−6, 3+3	8·0*b*
24	2773	,,	,,	=3, =4	8·6*b*

Feb. 4, Orange.

Oct. 12, D, Difficult.
Oct. 18, D, Difficult. 25 invisible.
Jan. 16, Difficult.

(8290) R PEGASI—*continued.*

1921					
Apr					
1	2781	45	Bh	2−10, 1−8, 3+2, 4+5	8·2
4	2784	,,	,,	3+1, 4+3	8·4
10	2790	,,	,,	3−3, =4	8·7
12	2792	90	,,	3−1, 4+2	8·5
23	2803	,,	,,	3−4, 4−2	8·9
28	2808	,,	,,	4−4	9·1*b*
June					
2	2843	45	,,	9−3, 13+3	10·5*b*
10	2851	90	,,	=13	10·9
27	2868	,,	,,	13−2, 15+2	11·1
28	2869	120	Bn	15 (2) v (1) 17	11·6
July					
4	2875	90	Bh	13−4, =15	11·3
8	2879	120	Bn	17 (2) v (1) 21	11·8
9	2880	60	D	<17	<11·7*b*
26	2897	90	Bh	21+1	11·8
29	2900	,,	,,	21−2, 25+4	12·1
31	2902	64	Ad	=21	11·9*b*
31	2902	60	D	<17	<11·7
Aug					
4	2906	80	Ca	<17	<11·7
8	2910	64	Ad	21−1	12·0*c*
15	2917	90	Bh	=25	12·4*b*
24	2926	160	Bo	28 (1) v (1) 31	12·7
25	2927	90	Bh	25−2	12·6
30	2932	,,	,,	21−10, 25−5	12·9
31	2933	160	Bo	27 (3) v (1) 31	12·6
Sept					
3	2936	120	D	25−3	12·7*b*
5	2938	160	Bo	33 (3) v (1) 35	12·9
5	2938	90	Bh	21−10, 25−5	12·9
7	2940	85	Bn	25−4	12·8*b*
10	2943	90	Bh	<25	<12·4
16	2949	,,	,,	=35	12·9
21	2954	160	Bo	33 (1) v (1) 35	12·9*c*
22	2955	120	Bn	31−1	12·8*b*
24	2957	90	Bh	21−10, 25−5	12·9
25	2958	150	,,	25−6	13·0
25	2958	64	Ad	=33	12·8*b*
25	2958	120	Bn	25−4, 31+1, y+3	12·7
26	2959	,,	Bh	25−5	12·9
27	2960	160	Bo	33 (1) v (1) 35	12·9
30	2963	90	Bh	25−6	13·0
Oct					
1	2964	64	Ad	=33	12·8*b*
1	2964	160	Bo	33 (1) v (1) 35	12·9
1	2964	120	Bn	26 (5) v (2) y	12·9
5	2968	,,	,,	=31, y+4	12·7
5	2968	90	Bh	25−5	12·9
6	2969	160	Bo	33 (1) v (1) 35	12·9
8	2971	150	Bh	25−6	13·0
16	2979	120	,,	25−5, =35	12·9
23	2986	90	,,	25−1	12·5
28	2991	79	Ma	27−1, 25−2	12·5
30	2993	160	Bo	27 (3) v (2) 33	12·6
31	2994	90	Bh	21−4, 25+2	12·3
Nov					
6	3000	140	Bo	27 (1) v (1) 25	12·4
6	3000	120	Bn	21 (2) v (1) 25	12·3

April 28, Bright orange.
July 31, Ad, Very difficult.
Aug. 4, Invisible.
Aug. 8, Very difficult.
Sept. 10, Not seen. 25 glimpsed.
Sept. 25, Oct. 1, Ad, Difficult.

1921					
Nov					
7	3001	90	Bh	<21	<11·9
12	3006	,,	,,	=21	11·9
17	3011	140	Bo	21 (3) v (1) 27	12·2*c*
19	3013	55	,,	17 (1) v (2) 21	11·8
22	3016	,,	,,	16 (1) v (1) 17	11·5
22	3016	90	Bh	21+2	11·7
23	3017	64	Ad	=21	11·9*c*
23	3017	120	Bn	17 (3) v (1) 21	11·9
23	3017	80	Ca	21−1, 22+1	12·0
23	3017	90	Hw	<21	<11·9*b*
24	3018	,,	Bh	21+3	11·6
26	3020	,,	,,	17+1	11·6
26	3020	55	Bo	13 (3) v (1) 16	11·2*b*
29	3023	90	Bh	15−2, 17+2	11·5*b*
Dec					
3	3027	,,	,,	15−2, 17+2	11·5
4	3028	60	D	<17	<11·7*b*
13	3037	90	Bh	=15, 17+3	11·4
17	3041	,,	Hw	=16	11·3*b*
17	3041	82	Ad	=22	12·1*b*
18	3042	140	Bo	16 (1) v (1) 17	11·5*b*
20	3044	90	Bh	13−3, =15	11·3
22	3046	50	Bn	15 (2) v (1) 17	11·6
23	3047	90	Bh	13−1, 15+1	11·1
24	3048	55	Bo	13 (3) v (2) 16	11·1
25	3049	90	Bh	13+1	10·8
28	3052	75	Bn	15 (2) v (1) 17	11·6
29	3053	90	Bh	13−4, 15+2, 17+4	11·2
1922					
Jan					
1	3056	,,	,,	9−2, 13+6	10·3
8	3063	,,	,,	13+2	10·7
10	2065	,,	,,	=13	10·9
10	3065	75	Bn	13 (3) v (1) 15	11·2*b*
11	3066	140	Bo	13 (1) v (3) 16	11·0*b*
16	3071	75	Bn	13 (2) v (1) 15	11·2
16	3071	40	Hw	<13	<10·9
17	3072	55	Bo	13 (1) v (3) 16	11·0
18	3073	90	Bh	13+3	10·6
20	3075	,,	,,	13+1	10·8
24	3079	45	,,	9−3, 13+5	10·4*b*
28	3083	90	,,	=9	10·1
Feb					
1	3087	40	Hw	<13	<10.9
2	3088	90	Bh	9+2	9·9
5	3091	,,	,,	9+5	9·6
10	3096	,,	,,	4+2	8·5
11	3097	50	Bn	3 (3) v (2) 4	8·6
14	3100	90	Bh	2−8, 4+5	8·2
20	3106	45	,,	2−3, 4+10	7·7
Mar					
19	3133	,,	,,	=1, =2	7·3
28	3142	,,	,,	=1, =2	7·3
Apr					
4	3149	,,	,,	2−4, 4+10	7·7
14	3159	,,	,,	2−7, 4+7	8·0
May					
2	3177	,,	,,	=4	8·7*b*
27	3202	,,	,,	4−8, 9+5	9·6
29	3204	32	Ca	8−1, =9	10·0
June					
4	3210	45	Bh	9−2	10·3
15	3221	,,	,,	=13	10·9

Nov. 7, Not seen.
Nov. 23, Ad, Very difficult.
Dec. 25, Orange.

(8290) R PEGASI—*continued.*

1922 June 26	3232	45	Bh	9−10, 13−2	11·1
July 2	3238	90	,,	13−1	11·0
14	3250	,,	,,	9−10, 13−4	11·2*b*
20	3256	,,	,,	13−6, 17+2	11·5
21	3257	140	Bo	17 (1) v (2) 21	11·8
27	3263	90	Bh	17−1, 21+2	11·8
30	3266	120	Bn	21 (1) v (1) 25	12·2
31	3267	90	Bh	=21	11·9
Aug 1	3268	140	Bo	21 (1) v (3) 27	12·0
11	3278	90	Bh	21−3, 25+2	12·2
17	3284	,,	,,	25−1	12·5
17	3284	140	Bo	27 (1) v (1) 25	12·4
23	3290	90	Bh	21−4, 25+1	12·3
25	3292	,,	,,	25−2	12·6
26	3293	275	Bo	25 (1) v (2) 29	12·5
31	3298	90	Bh	25−3	12·7
Sept 10	3308	,,	,,	25−5	12·9
18	3316	,,	,,	25−6, 35−1	13·0
21	3319	,,	,,	25−5	12·9
26	3324	,,	,,	25−5, 35−1	13·0
28	3326	275	Bo	<33	<12·8
Oct 6	3334	90	Bh	35−1	13·0
12	3340	275	Bo	<33	<12·8*b*
13	3341	120	Bn	31 (1) v (1) y	12·9
13	3341	75	Pr	25−5	12·9
13	3341	90	Bh	<35	<12·9*b*
15	3343	140	Bo	35 (1) v (1) 36	13·0
16	3344	75	Pr	25−5	12·9*b*
18	3346	90	Bh	35−2	13·1
21	3349	,,	,,	25−6, 35−2	13·1
22	3350	64	Ad	<25	<12·4
23	3351	120	Bn	31 (1) v (2) y	12·9
23	3351	75	Pr	<25	<12·4*b*
25	3353	90	Bh	25−10, 35−1	13·2
30	3358	150	,,	35−3	13·2
Nov 9	3368	,,	,,	35−2	13·1
13	3372	90	,,	25−5	12·9*b*
15	3374	120	Bn	25 (1) v (2) 31	12·5
18	3377	75	Pr	21−2, 25+3	12·1*b*
19	3378	150	Bh	25−1	12·5
23	3382	79	Ma	21−1	12·0
24	3383	90	Bh	21−3, 25+2	12·2
24	3383	120	Bn	24 (4) v (1) 25	12·4
28	3387	90	Bh	21−2, 25+3	12·1
Dec 5	3394	,,	,,	17−2, 21+1	11·9
8	3397	120	Bn	21 (2) v (1) 25	12·3
11	3400	90	Bh	15−3, =17, 21+3	11·6
16	3405	,,	,,	=17	11·7
16	3405	40	Hw	=16	11·3*b*
18	3407	90	Bh	17−1, 21+2	11·8
19	3408	32	Ca	16 (1) v (2) 18	11·4
20	3409	75	Pr	20−1, 22+2	11·9*b*
23	3412	,,	,,	17−1	11·8*b*
25	3414	90	Bh	=15, 17+3	11·4
1923 Jan 4	3424	,,	,,	9−8, 13−2, 15+2	11·0
4	3424	75	Bn	15 (2) v (1) 17	11·6

Oct. 22, Invisible.
Oct. 23, Pr, Difficult.

1923 Jan 4	3424	40	Ry	16−2·5, 17−2·5, 21+4	11·7*b*
5	3425	,,	,,	=16, =17	11·5
6	3426	150	Pr	13−3, 16+2	11·1*b*
6	3426	90	Bh	=13	10·9*b*
8	3428	,,	,,	13+1	10·8
10	3430	80	Ca	13 (3) v (1) 16	11·2
11	3431	60	Bn	15 (1) v (1) 17	11·5
12	3432	79	Ma	13 (5) v (1) 22, 22+5	11·8
14	3434	75	Bn	13−4, =15	11·3
14	3434	90	Bh	13+1	10·8
16	3436	40	Ry	16−2, 17−1	11·6*b*
20	3440	90	Bh	=13	10·9*b*
27	3447	,,	,,	=13	10·9
27	3447	50	Bn	13−3, 15+2	11·2*b*
Feb 4	3455	,,	,,	q (2) v (1) 13	10·8
8	3459	90	Bh	13+2	10·7
11	3462	50	Bn	q (2) v (1) 13	10·8
23	3474	45	Bh	9+1	10·0*b*
Mar 13	3492	,,	,,	4 (1) v (2) 9	9·2*b*
31	3510	,,	,,	2 (2) v (1) 4	8·2*b*
Apr 13	3523	,,	,,	2 (1) v (2) 4	7·8*b*
14	3524	,,	,,	2 (1) v (3) 4	7·7
22	3532	,,	,,	2 (1) v (2) 4	7·8
May 3	3543	,,	,,	2 (1) v (1) 4	8·0
17	3557	,,	,,	4+2	8·5*b*
30	3570	,,	,,	9+2	9·9*b*
June 2	3573	,,	,,	9−1	10·2
11	3582	,,	,,	9−2, 13+5	10·3*b*
16	3587	90	,,	9−3	10·4*b*
23	3594	,,	,,	9−4, 13+3	10·5
July 5	3606	,,	,,	9−5, 13+2	10·6
6	3607	60	D	13−2, 17+5	11·1*b*
8	3609	32	Ca	13 (2) v (5) 18	11·1
8	3609	90	Bh	9−5, =13	10·7
16	3617	60	D	13−4, 17+4	11·3*b*
20	3621	,,	,,	13−5, 17+2	11·4
20	3621	90	Bh	13−1, 15+3	11·0*b*
21	3622	94	Li	=17	11·7
30	3631	90	Bh	13−2, 15+2	11·1
Aug 3	3635	,,	,,	13−3, 15+1	11·2
4	3636	120	Ga	=16, 21+5	11·4*b*
7	3639	50	Ry	16−3, 17−3·5, 21+1	11·8
8	3640	120	Bn	21 (2) v (1) 25	12·3
9	3641	90	Bh	15−2, =17	11·6
14	3646	80	Ry	16−4, 17−4, 21−1·5, 25+2	12·0
17	3649	,,	,,	21−3·5, 24+1, 25+1	12·2
18	3650	90	Bh	17−1, 21+2	11·8
20	3652	80	Ry	16−7, 17−5, 21−3·5, 25+1·5, 24+2, =30	12·2
23	3655	90	Bh	=21	11·9*b*
30	3662	,,	,,	17−2, 21+1	11·9
Sept 2	3665	,,	,,	21+1	11·8

Aug. 7, T.

(8290) R PEGASI—*continued.*

1923					
Sept					
2	3665	140	Bo	27 (1) v (1) 35	12·4
2	3665	108	Ma	=25	12·4
5	3668	60	Ga	25−3	12·7
6	3669	120	Bn	25−2, 26 (2) v (1) 31	12·6
7	3670	90	Bh	21−2, 25+3	12·1*b*
7	3670	80	Ry	25−5, 28+3, 31+4	12·5*b*
8	3671	,,	,,	25−5, 31+3	12·7
8	3671	140	Bo	=25	12·4
8	3671	75	Pr	25−2, 31+1	12·6
8	3671	60	D	25−5	12·9*b*
11	3674	90	Bh	21−4, 25+1	12·3
13	3676	,,	,,	21−2, 25+3	12·1*b*
14	3677	140	Bo	=33	12·8*b*
15	3678	90	Bh	21−3, 25+2	12·2
16	3679	79	Ma	25−3·5, =y	12·9
17	3680	90	Bh	21−3, 25+2	12·2
18	3681	79	Ma	25−2, y+1	12·8
19	3682	80	Ry	25−6, 29−3, =31, =34, y+5	12·8
21	3684	90	Bh	25+1	12·3*b*
23	3686	,,	,,	25+1	12·3
26	3689	,,	,,	21−4, 25+1	12·3
28	3691	200	Ry	31−3, y+2	13·0*b*
30	3693	140	Bo	<33	<12·8*b*
30	3693	90	Bh	25−1	12·5
Oct					
2	3695	60	Ga	<33	<12·8*b*
5	3698	90	Bh	25−2	12·6
5	3698	170	Ry	31−5, y+1	13·1*b*
9	3702	90	Bh	21−7, 25−3	12·7
10	3703	170	Ry	=y	13·1
12	3705	90	Bh	25−5, =35	12·9
13	3706	60	Ga	<34	<12·9
16	3709	170	Ry	y−1·5	13·2*b*
19	3712	150	Bh	25−7, 35−2	13·1
23	3716	90	,,	35−2	13·1
29	3722	80	Ry	y−4·5	13·5*b*
29	3722	140	Bo	35 (1) v (1) 36	13·0
31	3724	90	Bh	35−2, =y	13·1
Nov					
7	3731	,,	,,	35−2, y−1	13·2
10	3734	120	Bn	y−1	13·2
10	3734	130	Ma	y−1	13·2*b*
10	3734	140	Bo	=36	13·0*b*
11	3735	170	Ry	y−2	13·3*b*
11	3735	150	Bh	y−1	13·2
16	3740	90	,,	=y	13·1
23	3747	,,	,,	=35, =y	13·0
28	3752	170	Ry	28−4, y+0·5	13·0*b*
30	3754	150	Bh	35−2, y−1	13·2
Dec					
2	3756	90	,,	=35	12·9
2	3756	120	Bn	31−1, y+2	12·9
3	3757	130	Ma	=y	13·1*b*
4	3758	120	Bn	=31, y+3	12·8
4	3758	90	Bh	=35, =y	13·0
8	3762	,,	,,	25−5, 35+1	12·9
11	3765	80	Ry	25−4, 28+2	12·6*b*
12	3766	90	Bh	25−4, 35+2	12·8
18	3772	,,	,,	25−3	12·7
22	3776	,,	,,	25−2, 35+2	12·7
24	3778	,,	,,	21−7, 25−1	12·6
1923					
Dec					
24	3778	80	Ry	25−3	12·7*b*
28	3782	90	Bh	25 (1) v (1) 35	12·7
31	3785	80	Ry	25−1·5	12·6*b*
1924					
Jan					
3	3788	90	Bh	17−2, 21+1	11·9
5	3790	,,	,,	21+1	11·8
6	3791	80	Ry	25−2, =27	12·5
6	3791	120	Bn	=25	12·4
6	3791	60	D	<21	<11·9
7	3792	130	Bo	27 (1) v (1) 25	12·4
7	3792	90	Bh	=21	11·9
14	3799	,,	,,	21+1	11·8
17	3802	80	Ry	25+1·5	12·3*b*
23	3808	150	Bh	21−1	12·0
25	3810	90	,,	21+3	11·6
25	3810	120	Bn	21 (3) v (1) 25	12·3
27	3812	80	Ry	21−5, 25+3	12·3
Feb					
1	3817	120	Bn	21 (2) v (1) 25	12·3
3	3819	80	Ry	21−4	12·3*c*
4	3820	120	Bn	21 (3) v (2) 25	12·2
7	3823	80	Ry	21−4·5, 25+2	12·3*b*
22	3838	90	Bh	9−2	10·3*b*
27	3843	45	,,	=9	10·1*b*
Mar					
2	3847	,,	,,	4−10, 9+4	9·7*b*
10	3855	90	,,	4 (1) v (2) 9	9·2
14	3859	45	,,	=4	8·7
26	3871	,,	,,	2 (1) v (1) 4	8·0*b*
Apr					
3	3879	,,	,,	2 (2) v (1) 4	8·2
6	3882	,,	,,	2 (1) v (1) 4	8·0*b*
11	3887	,,	,,	2 (2) v (1) 4	8·2*b*
14	3890	,,	,,	2 (3) v (1) 4	8·4
15	3891	30	Ry	=3, =4	8·6
18	3894	,,	,,	3+2, 4+2	8·4
25	3901	,,	,,	3+1, 4+1	8·5
30	3906	90	Bh	2 (2) v (1) 4	8·2
May					
2	3908	32	Ca	2 (9) v (2) 3	8·2
2	3908	50	Ry	3−2, =4	8·7
5	3911	45	Bh	2 (3) v (1) 4	8·4
9	3915	30	Ry	3−3, 4−1	8·8
16	3922	,,	,,	3−4·5, 4−3·5, 5+5	8·9
16	3922	45	Bh	2 (3) v (1) 4	8·4
21	3927	,,	,,	=4	8·7
26	3932	,,	,,	=4	8·7
27	3933	30	Ry	4−6, =5, 6+2	9·2
28	3934	45	Bh	4−1	8·8
31	3937	30	Ry	5−2·5, =6	9·4
June					
1	3938	90	Bh	4 (1) v (1) 5	9·0
6	3943	30	Ry	5−5, 9+6	9·7
11	3948	90	Bh	=5	9·3
13	3950	,,	,,	4−5, =5	9·3
17	3954	45	,,	5−1, 9+7	9·4*b*
18	3955	50	Ry	=9	10·1*b*
19	3956	90	Bh	5 (1) v (3) 9	9·5
24	3961	,,	,,	5 (1) v (1) 9	9·7*b*
24	3961	30	Ry	9−2·5	10·4
27	3964	50	,,	9−2·5, 13+4	10·4

Sept. 5, T.
Sept. 8, D, About. Difficult.
Oct. 2, 13, T. Invisible.

April 15, 25, May 9, 16, 27, 31, June 6, 24, Ry, t.
April 18, May 2, June 18, 27, Ry, T.

(8290) R PEGASI—*continued.*

1924					
June					
28	3965	90	Bh	5 (2) v (1) 9	9·8*b*
30	3967	,,	,,	9+1	10·0
July					
2	3969	50	Ry	9−3, 13+2	10·5
9	3976	90	Bh	9+2	9·9
10	3977	50	Ry	9−5, =13	10·7
13	3980	,,	Bn	9 (3) v (1) q	10·4
14	3981	90	Bh	=9	10·1
19	3986	,,	,,	9 (1) v (1) 13	10·5
21	3988	50	Ry	13−3, 16+2	11·1*b*
24	3991	90	Bh	13+1	10·8
25	3992	50	Ry	13−3, 15+1·5, 16+2, 17+5	11·2
26	3993	90	Bh	=13	10·9
29	3996	,,	,,	13+1	10·8
30	3997	50	Bn	13 (4) v (1) 15	11·2
30	3997	80	Ry	=15, 16+1, 17+3	11·3*b*
Aug					
2	4000	150	Bh	13−1	11·0
5	4003	80	Ry	16−1, 17+1	11·5
5	4003	120	Bn	15 (2) v (1) 17	11·6
7	4005	90	Bh	13−3, =15	11·3
18	4016	55	Ry	16−1, =17	11·5*b*
19	4017	90	Bh	13 (1) v (1) 17, =15	11·3
19	4017	120	Bn	17 (1) v (1) 21	11·8
21	4019	60	D	17−1, 21+2	11·8
27	4025	,,	,,	17−2, 21+1	11·9
27	4025	85	Ry	21−3, 25+5	12·1*b*
28	4026	90	,,	21−2·5, 25+3	12·2
Sept					
2	4031	,,	Bh	17 (1) v (1) 21	11·8
9	4038	,,	,,	=21	11·9
10	4039	150	Ry	=25, 27+2	12·3*b*
16	4045	90	Bh	21+1	11·8*b*
19	4048	120	D	21−4, 25+1	12·3
22	4051	60	,,	21−4, 25+1	12·3

June 30, Orange.
July 2, 10, 21, t.
July 9, Orange-yellow.
July 24, Yellow.
July 25, T.
Aug. 28, Sept. 10, 16-in. OG.

1924					
Sept					
23	4052	90	Bh	=21	11·9
27	4056	120	Bn	21 (3) v (1) 25	12·3
29	4058	90	Bh	21 (1) v (1) 25	12·2
Oct					
2	4061	,,	,,	25+1	12·3
15	4074	,,	,,	25−2	12·6
18	4077	130	Bo	<35	<12·9*b*
22	4081	120	Bn	25 (4) v (1) 31	12·7
23	4082	90	Bh	25−5	12·9
24	4083	80	Ry	y+2	12·9*b*
26	4085	90	Bh	25−6, 35−1	13·0
30	4089	200	Ry	y+2	12·9
Nov					
1	4091	,,	,,	y+2·5	12·8
15	4105	90	Bh	25−5, =35	12·9
22	4112	80	Ry	y+1	13·0*b*
24	4114	90	Bh	25−6, 35−1	13·0
27	4117	,,	,,	25−4, 35+1	12·8
27	4117	T	Bk	=25	12·4
27	4117	120	Bn	=y	13·1
29	4119	150	Bh	35+1	12·8
30	4120	130	Bo	<33	<12·8
Dec					
4	4124	T	Bk	33−1, 35+1	12·9
12	4132	,,	,,	22−5, 33+2	12·6
12	4132	,,	Ba	=33	12·8
13	4133	80	Ry	25−6, 31+2	12·8*b*
13	4133	90	Bh	25 (1) v (1) 35	12·7*b*
17	4137	T	Bk	27−3, 33+2	12·6
18	4138	80	Ry	25−4·5, 31+2·5	12·7
19	4139	90	Bh	25−3	12·7
20	4140	T	Bk	=25, 33+4	12·4
24	4144	,,	,,	23−2, 25+2, =27	12·2
25	4145	150	Bh	=25	12·4
26	4146	130	Bo	25 (2) v (1) 31	12·6
26	4146	120	Bn	25 (1) v (1) 31	12·6
27	4147	80	Ry	21−5, 25+1·5	12·4*b*
28	4148	60	D	<25	<12·4
28	4148	90	Bh	=25	12·4*b*
30	4150	,,	,,	21 (1) v (2) 25	12·1

Oct. 18, Nov. 30, Unseen.
Dec. 28, D, Suspected.

(7658) X PEGASI. (V. 7.)

H.D. 211614.

As the magnitudes for the stars p, q, and r, given in **H.A., 57,** 269, do not agree with the usual Harvard Scale, the following values were provisionally adopted during the years 1920-24 :—

H.C.O. Letter.	Mag.
p	12·8
q	13·0
r	13·0

r is probably variable. s does not exist.

The faint comparison stars t, u, and β have also been used :—

Letter	Position.	Mag.
t	See **H.A., 57,** 269	13·4
u	,, ,, ,,	13·1
β	$+12^s$, $+0'·5$	14·5

The magnitudes here adopted for each are derived from estimates by Professors S. A. Mitchell and H. L. Alden with the Leander M'Cormick Observatory 26-in. refractor.

Date.	Julian Date.	Inst.	Observer.	Comparisons.	Deduced Mag.
1920 Jan					
1	2325	90	Bh	=g	10·9
8	2332	,,	,,	d−2, g+6	10·3
13	2337	,,	,,	c−2, d+1	10·0
15	2339	,,	,,	c−1, d+2	9·9
21	2345	48	Bg	c−2, d+1	10·0*b*
23	2347	90	Bh	c+2	9·6
Feb					
4	2359	,,	,,	c+2	9·6
11	2366	,,	,,	=c	9·8*b*
15	2370	,,	,,	=c	9·8
23	2378	45	,,	c−4, d−1	10·2
29	2384	,,	,,	c−2, d+1	10·0*b*
Mar					
7	2391	,,	,,	d−2	10·3
12	2396	90	,,	d−5, g+3	10·6
25	2409	,,	,,	g−3	11·2
31	2415	,,	,,	g−5, =l	11·4
Apr					
9	2424	,,	,,	l−6	12·0*b*
12	2427	,,	,,	g−10	11·9
17	2432	,,	,,	l−6	12·0
27	2442	,,	,,	l−10	12·4*b*
May					
2	2447	55	Bg	=n	12·2*c*
9	2454	90	Bh	n−5	12·7*b*
12	2457	,,	,,	n−3, o+2	$12^m·5$
17	2462	,,	,,	<o	<12·7
June					
8	2484	,,	,,	n−10	13·2
9	2485	60	D	<k	<11·0*b*
18	2494	90	Bh	...	<13·0
23	2499	,,	,,	=n	12·2
23	2499	75	Bg	m−2, n+3	11·9
29	2505	90	Bh	g−10, n+4	11·8*b*
July					
8	2514	55	Bg	g−1, l+4	11·0
10	2516	90	Bh	g−2	11·1
12	2518	30	D	h+2	10·7*b*
13	2519	55	Bg	f−3, =g	10·9
19	2525	60	D	c−4, =d	10·1
19	2525	90	Bh	b−9, c−2, g+10	9·9
22	2528	60	D	c−1, d+2	9·9
27	2533	90	Bh	b−6, c+2	9·6*b*
30	2536	,,	,,	b−7, c+1	9·7
Aug					
2	2539	,,	,,	b−6, c+2	9·6
6	2543	45	,,	b−6, c+2	9·6
10	2547	30	D	b−5, c+3	9·5
13	2550	90	Bh	b−5, c+3	9·5
15	2552	55	Bg	b−5, c+3	9·5
16	2553	30	D	b−5, c+4	9·4
20	2557	90	Bh	b−7, c+1	9·7
26	2563	,,	,,	c+1	9·7
26	2563	75	Bg	b−7, c+1	9·7
Sept					
6	2574	90	Bh	=c, d+3	9·8
8	2576	60	D	c−0·5	9·8
10	2578	30	,,	c−2, d+1	10·0
11	2579	75	Gi	c−1·5, d+1	10·0
12	2580	30	D	c−2, d+2	9·9
13	2581	90	Bh	c−2, d+1	10·0
17	2585	,,	,,	c−3, =d	10·1
18	2586	55	Bg	d−2, e+2	10·3
19	2587	60	D	d−3, h+6	10·4
22	2590	90	Bh	c−3, =d	10·1
26	2594	,,	,,	d−4, g+4	10·5
Oct					
1	2599	,,	,,	d−4, g+2	10·6
3	2601	30	D	h−2	11·1*b*
6	2604	117	Gi	d−2·5, =h	10·6
6	2604	90	Bh	g−1	11·0
10	2608	60	D	h−5, k−3, l+2	11·3
11	2609	55	Bg	g−l, l+4	11·0*b*
11	2609	130	Mn	d−3	10·4*b*

May 2, About.
May 17, Not seen.
June 18, Not visible.

(7658) X PEGASI—*continued.*

1920 Oct 12	2610	60	Mn	g (1) v (1) k	11·0*b*
12	2610	90	Bh	g−2	11·1
19	2617	,,	,,	g−4	11·3
19	2617	55	Bg	g−4, l+1	11·3*b*
24	2622	130	Mn	=m	11·7*b*
29	2627	60	,,	m−4, r+6	12·2*b*
30	2628	55	Bg	l−1, m+2	11·5
Nov 1	2630	60	D	<l	<11·4*b*
7	2636	117	Gi	=m	11·7
10	2639	90	Bh	g−8, n+5	11·7
13	2642	,,	,,	g−10	11·9
16	2645	55	Bg	m−3, n+2	12·0*b*
19	2648	117	Gi	r+3	12·7
21	2650	90	Bh	n+2	12·0*b*
24	2653	,,	,,	<n	<12·2
Dec 1	2660	75	Bg	=o	12·7*b*
5	2664	90	Bh	<o	<12·7
8	2667	,,	,,	<o	<12·7
11	2670	150	,,	t+2, u+1	13·1
12	2671	,,	,,	t+2, u+1	13·1
26	2685	90	,,	o−2	12·9
28	2687	,,	,,	o+1	12·6
1921 Jan 2	2692	,,	,,	l−8, =n	12·2*b*
6	2696	,,	,,	l−2	11·6
7	2697	,,	,,	=l	11·4
10	2700	117	Gi	g−3·5, l+1	11·3*b*
13	2703	90	Bh	h−2, l+3	11·1
21	2711	,,	,,	k+3	10·7
28	2718	117	Gi	b−7, c+2	9·6*b*
Feb 2	2723	90	Bh	=c	9·8
9	2730	,,	,,	b−4, c+4	9·4
14	2735	,,	,,	b−3, c+5	9·3
17	2738	,,	,,	=b	9·0
25	2746	,,	,,	=b	9·0
Mar 6	2755	,,	,,	b−1	9·1
24	2773	,,	,,	b−5, c+3	9·5
Apr 1	2781	,,	,,	c+1	9·7
4	2784	45	,,	=c	9·8
8	2788	90	,,	c−2, d+1	10·0*b*
12	2792	,,	,,	=d	10·1
19	2799	,,	,,	=d	10·1
21	2801	,,	,,	d−1	10·2
23	2803	,,	,,	d−1	10·2
25	2805	,,	,,	d−2	10·3
May 9	2819	,,	,,	d−9, =k	11·0
15	2825	,,	,,	k−5, l−1	11·5*b*
24	2834	150	,,	Estimated	<12·0
31	2841	,,	,,	,,	<12·2
31	2841	60	D	<l	<11·4*b*
June 2	2843	90	Bh	n+1	12·1
5	2846	,,	,,	=n	12·2
7	2848	117	Gi	=r	13·0*b*
15	2856	90	Bh	n−2	12·4*b*
21	2862	117	Gi	=n	12·2*b*
1921 June 24	2865	90	Bh	n−4	12·6
27	2868	,,	,,	l−10, n−5	12·6*b*
July 1	2872	117	Gi	n−2	12·4*b*
2	2873	90	Bh	n−8	13·0
4	2875	,,	,,	n−8	13·0
5	2876	75	Bg	<p	<12·8
7	2878	90	Bh	n−5	12·7*b*
13	2884	117	Gi	=n	12·2
18	2889	150	Bh	n−3	12·5
26	2897	90	,,	h−10, n+3	11·9
27	2898	117	Gi	=m	11·7
29	2900	90	Bh	k−6, n+6	11·6
30	2901	60	D	m−3	12·0*b*
Aug 1	2903	,,	,,	=l	11·4*b*
1	2903	55	Bg	l−1, m+2	11·5
6	2908	90	Bh	h−2, l+3	11·1
6	2908	75	Gi	=k	11·0
8	2910	55	Bg	h−3, l+2	11·2
14	2916	45	Bh	d−4, h+4	10·5
19	2921	90	,,	d+1	10·0
20	2922	75	Bg	d−2, h+6	10·3*b*
25	2927	90	Bh	b−7, c+1	9·7
26	2928	117	Gi	c−1·5, d+2, h+4	10·1
26	2928	60	D	c−2, d+1	10·0
28	2930	,,	,,	c−1, d+3	9·8
29	2931	45	Bh	b−6, c+2	9·6
30	2932	90	,,	=c	9·8
31	2933	60	D	=c	9·8
Sept 1	2934	30	,,	c+1	9·7
2	2935	,,	,,	b−7, c+2	9·6
3	2936	,,	,,	c+1	9·7
4	2937	90	Bh	b−4, c+4	9·4
5	2938	30	D	b−6, c+2	9·6
6	2939	,,	,,	=c	9·8
7	2940	,,	,,	b−7, c+1	9·7
7	2940	55	Bg	c−2, d+1	10·0
8	2941	30	D	b−6, c+2·5	9·5
8	2941	117	Gi	b−4·5, c+1·5	9·5
10	2943	90	Bh	b−4, c+4	9·4
16	2949	,,	,,	b−4, c+4	9·4
21	2954	,,	,,	b−4, c+4	9·4
21	2954	55	Bg	=c	9·8
22	2955	30	D	b−6, c+3	9·5
24	2957	117	Gi	b−3·5, c+2	9·4
24	2957	90	Bh	b−5, c+3	9·5
25	2958	55	Bg	b−6, c+2	9·6
25	2958	30	D	c+1	9·7
27	2960	,,	,,	c+2	9·6*b*
28	2961	,,	,,	c+1	9·7
28	2961	55	Bg	b−6, c+2	9·6
30	2963	30	D	c−1	9·9*b*
30	2963	90	Bh	c+1	9·7
Oct 5	2968	,,	,,	=c	9·8
5	2968	55	Bg	b−7, c+1	9·7
7	2970	117	Gi	=c	9·8
8	2971	150	Bh	c−1, d+2	9·9
16	2979	90	,,	c−2, d+1	10·0
16	2979	55	Bg	c−2, d+1	10·0
23	2986	90	Bh	c−3, =d	10·1

Nov. 24, Dec. 5, 8, Not seen.
Dec. 1, About.
May 24, 31, Bh, Not seen.

July 5, Glimpsed.
July 30, Difficult.
Aug. 1, D, About.

(7658) X PEGASI—*continued.*

1921 Oct 24	2987	55	Bg	=d	10·1*c*
30	2993	117	Gi	=h	10·9*b*
31	2994	90	Bh	h+1	10·8
Nov 6	3000	55	Bg	h−1, l+4	11·0
7	3001	90	Bh	=h	10·9
12	3006	,,	,,	h−2	11·1
18	3012	117	Gi	=m	11·7
22	3016	90	Bh	=k, =l	11·2*b*
23	3017	55	Bg	m−1, n+4	11·8
24	3018	90	Bh	h−5, l−1	11·5
26	3020	,,	,,	h−7	11·6
29	3023	75	Bg	m−3, n+2	12·0*b*
30	3024	117	Gi	m−4·5, r+3	12·4*b*
Dec 3	3027	90	Bh	l−1	11·5*b*
19	3043	,,	,,	h−10, l−5	11·9
20	3044	75	Bg	n−3, o+2	12·5
23	3047	45	Bh	=n	12·2*b*
25	3049	150	,,	=n	12·2
29	3053	90	,,	n−1, o+3	12·4
1922 Jan 1	3056	,,	,,	=n	12·2*b*
5	3060	...	Gi	r (1) v (2) q	13·0
10	3065	90	Bh	n−2, o+2	12·5*b*
Mar 28	3142	,,	,,	b−2, c+6	9·2*b*
Apr 4	3149	,,	,,	b−2, c+6	9·2*b*
14	3159	,,	,,	b−3, c+5	9·3
23	3168	,,	,,	b−4, c+4	9·4
May 2	3177	45	,,	b−5, c+3	9·5
8	3183	,,	,,	=c	9·8
17	3192	90	,,	c−4, d−1	10·2
19	3194	...	Gi	=d	10·1
27	3202	90	Bh	h−1	11·0
June 1	3207	...	Gi	h−2·5, =k	11·1
4	3210	45	Bh	h−3	11·2*b*
12	3218	90	,,	l−1	11·5
19	3225	,,	,,	=n	12·2*b*
21	3227	...	Gi	=r	13·0
26	3232	90	Bh	n−5	12·7*b*
29	3235	,,	,,	n−5	12·7*b*
July 3	3239	...	Gi	=u	13·1
10	3246	90	Bh	o−1	12·8*b*
14	3250	,,	,,	o−5	13·2*b*
19	3255	...	Gi	u−5	13·6
27	3263	90	Bh	o−8	13·5*b*
30	3266	120	Br	u−2	13·3*b*
30	3266	...	Gi	u−4·5	13·6
Aug 11	3278	90	Bh	o−3	13·0*b*
12	3279	,,	,,	n−3, =o	12·6*b*
16	3283	75	Bg	m−3, n+2	12·0
17	3284	...	Gi	r+2	12·8
17	3284	90	Bh	n−2, o+2	12·5*b*
20	3287	,,	,,	=n	12·2*b*
20	3287	55	Bg	m−2, n+3	11·9
23	3290	90	Bh	l−2	11·6
24	3291	150	Wf	=l	11·4*b*
25	3292	90	Bh	=l	11·4
25	3292	45	Br	m−1, n+4	11·8*b*
26	3293	55	Bg	m−1, n+4	11·8
27	3294	...	Gi	m−2·5	11·9
1922 Aug 31	3298	55	Bg	=m	11·7
Sept 4	3302	45	Bh	=l	11·4
7	3305	150	Wf	h−6	11·5*c*
9	3307	90	Bh	=l	11·4
10	3308	62	Wf	l−2, m+1	11·6
13	3311	,,	,,	m−2	11·9
14	3312	90	Bh	k−2, l+2	11·2
16	3314	62	Wf	=m	11·7
19	3317	,,	,,	k−4, =l	11·4
19	3317	...	Gi	k (2) v (1) l	11·3
20	3318	55	Bg	k−2, l+2	11·2
21	3319	90	Bh	h−2, l+3	11·1
23	3321	62	Wf	l−1, m+2	11·5
24	3322	55	Bg	=h, k+1	10·9*b*
26	3324	90	Bh	h−2	11·1
29	3327	75	Bg	=h	10·9
Oct 2	3330	45	Bh	=k	11·0
5	3333	62	Wf	d−6, h+2	10·7*b*
6	3334	90	Bh	=h, =k	11·0
7	3335	,,	,,	=h	10·9
11	3339	,,	,,	h+1	10·8
11	3339	55	Bg	f−1, g+2	10·7
13	3341	...	Gi	=h	10·9
13	3341	90	Bh	d−5, h+3	10·6
14	3342	,,	,,	d−4, h+4	10·5
14	3342	62	Wf	d (1) v (1) h	10·5
16	3344	55	Bg	d−2, e+2	10·3*b*
18	3346	90	Bh	=d	10·1
21	3349	,,	,,	=c	9·8
25	3353	,,	,,	b−7, c+1	9·7
25	3353	55	Bg	c−3, =d	10·1*b*
28	3356	45	Bh	b−6, c+2	9·6
Nov 2	3361	55	Bg	c−1, d+2	9·9
4	3363	90	Bh	b−4, c+4	9·4
5	3364	...	Gi	b (5) v (2) c	9·5
9	3368	55	Bg	=c, d+3	9·8*b*
11	3370	160	Br	b−6, c+2	9·6
11	3370	90	Bh	b−4, c+4	9·4
14	3373	,,	,,	b−2, c+6	9·2
17	3376	...	Gi	b (2) v (1·5) c	9·4
19	3378	90	Bh	b−2, c+6	9·2
24	3383	,,	,,	b−5, c+3	9·5
24	3383	55	Bg	c−2, d+1	10·0*b*
30	3389	...	Gi	b (7) v (1·5) c	9·6
Dec 1	3390	90	Bh	b−4, c+4	9·4*b*
6	3395	,,	,,	b−6, c+2	9·6
6	3395	55	Bg	c−3, =d	10·1*b*
11	3400	90	Bh	=c	9·8
16	3405	55	Bg	c−3, =d	10·1*b*
17	3406	90	Bh	c−2, d+1	10·0
20	3409	26	Bg	c−3, =d	10·1*b*
23	3412	90	Bh	c−5, d−2	10·3*b*
25	3414	,,	,,	d−3	10·4
1923 Jan 4	3424	,,	,,	h−2	11·1
8	3428	,,	,,	h−4	11·3
10	3430	65	Bg	=m	11·7*b*
14	3434	90	Bh	h−8	11·7
19	3439	117	Gi	=n	12·2*b*
23	3443	157	Wf	q−4	13·4

Jan. 10, About.

(7658) X PEGASI—*continued.*

1923 Feb					
4	3455	90	Bh	<o	<12·7
9	3460	,,	,,	<o	<12·7
Mar					
2	3481	,,	,,	n−10	13·2*b*
13	3492	,,	,,	n−5	12·7*b*
Apr					
1	3511	,,	,,	h−8, l−3	11·7
9	3519	,,	,,	l−2	11·6*b*
14	3524	,,	,,	h−4, l+1	11·3
15	3525	62	Wf	l−3, =m	11·7
17	3527	90	Bh	h−3	11·2
22	3532	,,	,,	=h	10·9
23	3533	62	Wf	k−3, l+1	11·3
May					
3	3543	90	Bh	c−6, h+5	10·4
17	3557	,,	,,	=c	9·8*b*
21	3561	62	Wf	=e, h+4	10·5
30	3570	90	Bh	c+2	9·6
June					
2	3573	,,	,,	=c	9·8
5	3576	62	Wf	b−5, c+1	9·6
9	3580	,,	,,	b−6, c+3	9·5
11	3582	90	Bh	b−6, c+2	9·6
11	3582	60	D	=c	9·8
21	3592	90	Bh	c+1	9·7
22	3593	117	Gi	b (3·5) v (1) c	9·6
23	3594	90	Bh	c−1	9·9
28	3599	150	Wf	c−3, =d	10·1
July					
1	3602	90	Bh	d−4, h+4	10·5
5	3606	,,	,,	h+2	10·7
5	3606	62	Wf	c−5, d−1	10·2
6	3607	60	D	d−7, h+2	10·8
10	3611	62	Wf	=g	10·9
13	3614	55	Bg	g (2) v (3) l	11·1
14	3615	62	Wf	g−3, l+2	11·2
20	3621	60	D	l−2, m+1	11·6
20	3621	90	Bh	h−2	11·1
22	3623	OG	Ph	q+1	12·9
30	3631	90	Bh	=n	12·2
Aug					
2	3634	75	Bg	=n	12·2*b*
3	3635	90	Bh	n−3, o+2	12·5
5	3637	157	Wf	p−2, q+2	12·9
5	3637	OG	Ph	=r	13·0
8	3640	75	Bg	n (3) v (2) o	12·5
9	3641	90	Bh	=r	13·0
12	3644	150	Wf	q−2	13·2
15	3647	157	,,	q−4	13·4
15	3647	OG	Ph	r−4	13·4*b*
18	3650	90	Bh	n−10, r−2	13·2
26	3658	,,	,,	r−3	13·3
28	3660	,,	,,	r−3	13·3
30	3662	150	,,	r−3	13·3
31	3663	90	,,	n−10	13·2
Sept					
2	3665	,,	,,	r+1	12·9
3	3666	157	Wf	q−7, β+2	14·0*b*
5	3668	OG	Ph	r−8	13·8*c*
7	3670	90	Bh	r−2	13·2
8	3671	75	Bg	<p	<12·8
8	3671	157	Wf	q−10, β+2	14·2
10	3673	120	Br	r−8, u−7	13·8
12	3675	300	Wf	q (8) v (2) β	14·2
1923 Sept					
16	3679	90	Bh	r−3	13·3
17	3680	75	Bg	<p	<12·8
21	3684	90	Bh	<r	<13·0
26	3689	,,	,,	n−8, r+2	12·9
29	3692	157	Wf	q−4, β+5	13·7
29	3692	120	Br	u−7	13·8
30	3693	90	Bh	=r	13·0
Oct					
1	3694	,,	,,	r−1	13·1
4	3697	,,	,,	r−1	13·1
8	3701	157	Wf	q−2	13·2
9	3702	90	Bh	r+3	12·7
11	3704	,,	,,	n−3, r+5	12·5
14	3707	120	Br	r	13·0
15	3708	75	Bg	=p	12·8*b*
17	3710	90	Bh	l−8, r+8	12·2
19	3712	,,	,,	l−6	12·0
21	3714	,,	,,	l−6	12·0
23	3716	,,	,,	l−5	11·9
25	3718	,,	,,	n+5	11·7
27	3720	55	Bg	=m	11·7*b*
27	3720	150	Wf	m−3, n+5	11·8*b*
31	3724	,,	,,	=m, n+5·5	11·7*b*
Nov					
4	3728	45	Br	h−4, l+1	11·3
4	3728	55	Bg	−l	11·4
7	3731	90	Bh	h−7	11·6
10	3734	,,	,,	h−5	11·4
10	3734	55	Bg	h (2) v (1) l	11·2*b*
14	3738	45	Br	d−6, k+3	10·7
16	3740	90	Bh	h−3, l+2	11·2
23	3747	,,	,,	l+2	11·2
30	3754	,,	,,	h−1	11·0
Dec					
2	3756	,,	,,	h−1	11·0
2	3756	55	Bg	f (2) v (1) h	10·8*b*
3	3757	160	Br	d−4, h+4	10·5
4	3758	90	Bh	h−1	11·0
6	3760	,,	,,	−h	10·9
8	3762	,,	,,	h+2	10·7
13	3767	,,	,,	c−6, h+5	10·4
18	3772	,,	,,	c−2	10·0
22	3776	,,	,,	c+1	9·7
24	3778	,,	,,	c+2	9·6
28	3782	,,	,,	b−5, c+3	9·5
1924 Jan					
3	3788	,,	,,	b−2	9·2
5	3790	,,	,,	−b	9·0*b*
6	3791	48	Bg	b (2) v (1) c	9·5
6	3791	160	Br	b−6, c+2	9·6
7	3792	90	Bh	−b	9·0
9	3794	62	Wf	b−5, c+3	9·5
11	3796	90	Bh	b−2	9·2
17	3802	,,	,,	b (1) v (2) c	9·2
19	3804	150	Wf	=c, d+3	9·8
23	3808	90	Bh	b (2) v (1) c	9·5
26	3811	,,	,,	=c	9·8
Feb					
14	3830	,,	,,	c−1, d+2	9·9
22	3838	,,	,,	d−1	10·2*b*
27	3843	,,	,,	d−4	10·5*b*
Mar					
2	3847	45	,,	d−7	10·8*b*

Feb. 4, 9, Not seen.
Aug. 2, About.

Sept. 21, Not seen.
Nov. 14, About.

(7658) X PEGASI—*continued.*

1924 Mar					
10	3855	90	Bh	n+2	12·0*b*
26	3871	,,	,,	n−5	12·7*b*
Apr					
3	3879	,,	,,	n−10	13·2*b*
14	3890	,,	,,	Estimated	<13·0*b*
24	3900	150	Wf	m−4, n+2	12·0
30	3906	90	Bh	n−5	12·7*b*
May					
5	3911	,,	,,	=n	12·2
11	2917	150	Wf	m−2, n+4	11·8*b*
16	3922	90	Bh	n+5	11·7*b*
22	3928	,,	,,	n+7	11·5
25	3931	62	Wf	=k, l+3	11·1
28	3934	150	,,	d−6, h+2	10·7
June					
1	3938	62	,,	d−4, h+2	10·6
4	3941	90	Bh	d−9	11·0
7	3944	62	Wf	d−2, h+5	10·4
13	3950	90	Bh	c−4, d−1	10·2
17	3954	,,	,,	=c, =d	9·9*b*
19	3956	,,	,,	=c, d+3	9·8
23	3960	M	Ph	=d	10·1*b*
23	3960	62	Wf	c−2, d+2	9·9
24	3961	90	Bh	b (3) v (1) c	9·6
27	3964	,,	,,	c+2	9·6
27	3964	62	Wf	=d	10·1
30	3967	M	Ph	b (2) v (1) d, c−2	9·8
30	3967	90	Bh	=c	9·8
July					
2	3969	,,	,,	=c	9·8
3	3970	62	Wf	c−1, d+3	9·8
5	3972	90	Bh	=c	9·8
7	3974	62	Wf	c−1, d+3	9·8
7	3974	M	Ph	b (1) v (1) d, =c	9·6
9	3976	90	Bh	b (3) v (1) c	9·6
10	3977	M	Ph	b (1) v (1) d, c−1	9·6
12	3979	90	Bh	b (3) v (1) c	9·6
15	3982	45	,,	b (3) v (1) c	9·6
19	3986	90	,,	b (3) v (1) c	9·6
19	3986	55	Bg	=c	9·8*b*
22	3989	62	Wf	=c	9·8
24	3991	55	Bg	c (1) v (2) d	9·9
24	3991	90	Bh	b (3) v (1) c	9·6
27	3994	,,	,,	b (2) v (1) c	9·5
27	3994	62	Wf	c−0·5, d+3	9·8
29	3996	90	Bh	=c	9·8
Aug					
1	3999	62	Wf	=c, d+3	9·8
2	4000	90	Bh	b (2) v (1) c	9·5
5	4003	M	Ph	b (2) v (1) d, =c	9·7
6	4004	62	Wf	c−2, d+0·5	10·0
7	4005	75	Bg	d (1) v (4) h	10·3
7	4005	90	Bh	b (2) v (1) c	9·5
9	4007	,,	,,	c+1	9·7
10	4008	62	Wf	c−2, d+0·5	10·0
15	4013	90	Bh	c−2, d+1	10·0
18	4016	55	Bg	f (2) v (1) h	10·8
19	4017	OG	Ph	c−2, d+1	10·0
19	4017	90	Bh	=d	10·1
22	4020	,,	,,	d (1) v (1) h	10·5
22	4020	55	Bg	=h	10·9*b*
22	4020	100	Br	h+1	10·8
23	4021	62	Wf	d−6, =h, k+2	10·8

April 14, Not seen.

1924 Aug					
26	4024	62	Wf	k−2, l+2	11·2
27	4025	90	Bh	h−1	11·0
27	4025	60	D	l−1, m+2	11·5
27	4025	75	Bg	h (1) v (2) l	11·1
31	4029	,,	,,	l (1) v (2) m	11·5
31	4029	62	Wf	k−3, l+2	11·3
Sept					
2	4031	90	Bh	h−3	11·2
5	4034	,,	,,	h−5	11·4
7	4036	62	Wf	m−1	11·8*b*
9	4038	90	Bh	h−5	11·4
14	4043	,,	,,	h (1) v (1) n	11·6
16	4045	,,	,,	l−3	11·7
22	4051	75	Bg	n (2) v (3) o	12·4
23	4052	90	Bh	=n	12·2
26	4055	231	Wf	q−1, t+2	13·2
27	4056	90	Bh	n−2	12·4
29	4058	,,	,,	n (1) v (2) o	12·4
Oct					
2	4061	,,	,,	=o	12·7
3	4062	150	Lp	<o	<12·7*b*
5	4064	157	Wf	q−3	13·3
6	4065	90	Bh	=o	12·7
11	4070	120	Br	=q	13·0*b*
15	4074	90	Bh	o−3	13·0*b*
16	4075	157	Wf	q−5, o−2·5	13·2
23	4082	150	Lp	Estimated	<13·0*b*
23	4082	75	Bg	=p	12·8*b*
23	4082	120	Br	Estimated	14·0*b*
23	4082	90	Bh	o−3	13·0
31	4090	,,	,,	o−1	12·8*b*
Nov					
3	4093	,,	,,	n (1) v (1) o	12·5*b*
10	4100	,,	,,	=n	12·2
15	4105	,,	,,	h−7, l−2	11·6
19	4109	,,	,,	h−3	11·2
24	4114	,,	,,	=h	10·9*b*
27	4117	T	Bk	h−2, =k	11·1
28	4118	90	Bh	=h	10·9*b*
Dec					
2	4122	,,	,,	d−2, h+5	10·4
3	4123	94	Li	h (2) v (8) l	11·0*b*
4	4124	T	Bk	d−5, h+2	10·7
6	4126	94	Li	=h	10·9*b*
6	4126	90	Bh	d−2	10·3
9	4129	,,	,,	d−1	10·2
10	4130	193	Li	=h	10·9
12	4132	T	Bk	d−3, h+4	10·5
13	4133	94	Li	d (7) v (3) h	10·7
14	4134	90	Bh	=c, d+3	9·8
19	4139	,,	,,	=c	9·8
20	4140	T	Bk	d (4) v (1) h	10·7
24	4144	,,	,,	d−2, h+5	10·4
26	4146	55	Bg	d (1) v (2) f	10·3
26	4146	90	Bh	c+1	9·7
30	4150	,,	,,	c+2	9·6
31	4151	75	Bg	c (1) v (1) d	9·9

Oct. 3, Not seen.
Oct. 11, About.
Oct. 23, Lp, Glimpsed. Br, About. Just glimpsed.
Dec. 4, 20, 5c.
Dec. 12, 4c.

(1222) R PERSEI. (V. 1.)

H.D. 032335.

Date.	Julian Date.	Inst.	Observer.	Comparisons.	Deduced Mag.
1920 Sept					
10	2578	117	Gi	=62	13·6*b*
Oct					
4	2602	,,	,,	=62	13·6*b*
Nov					
5	2634	75	,,	21−1, 25+1	10·6
18	3647	,,	,,	=9	9·5
Dec					
7	2666	,,	,,	4−1, 5+2	8·9
1922 Jan					
7	3062	...	,,	21 (3·5) v (3·5) 34	11·0
19	3074	...	,,	=17	10·1
Feb					
14	3100	...	,,	=4	8·8
26	3112	...	,,	4 (4) v (2) 5	8·9
Mar					
17	3131	...	,,	5 (4·5) v (2) 9	9·4
Apr					
13	3158	...	,,	23 (4·5) v (2) 31	11·2
June					
25	3231	...	,,	<40	<12·3
July					
8	3244	...	,,	=40	12·3
21	3257	...	,,	21 (3·5) v (2·5) 34	11·2
26	3262	150	Wf	17−4, 21−1, 23+3	10·5
31	3267	...	Gi	11 (2) v (1·5) 17	10·0
Aug					
11	3278	...	,,	5 (4·5) v (2) 9	9·4
16	3283	62	Wf	5−2, 9+3	9·2
23	3290	,,	,,	5+1, 9+6	8·9
23	3290	45	Br	4−1, 5+1	8·9
24	3291	...	Gi	4+1·5, 5+3	8·7
Sept					
13	3311	62	Wf	3−8, 4+4	8·3*b*
19	3317	...	Gi	3 (10) v (3·5) 4	8·4
23	3321	62	Wf	=5	9·0
Oct					
13	3341	,,	,,	5−4, 9+1	9·4
13	3341	...	Gi	5 (3·5) v (3·5) 9	9·3
14	3342	34	Li	7 (9) v (1) 8	9·3
16	3344	,,	,,	7 (6) v (4) 8	9·3
16	3344	70	Gr	=9	9·5
18	3346	34	Li	8 (7) v (3) 9	9·5
23	3351	,,	,,	=9	9·5
24	3352	100	Lp	=17	10·1
27	3355	34	Li	9 (4) v (6) 11	9·7
Nov					
1	3360	94	,,	<21	<10·4*c*
5	3364	...	Gi	23−1, =25	10·9
10	3369	70	Gr	=33	11·7
10	3369	94	Li	35 (5) v (5) 36	11·9*b*
11	3370	100	Lp	=34	11·7*b*
15	3374	,,	,,	40+1	12·2*b*
16	3375	70	Gr	=36	12·0

June 25, Glimpsed.
Nov. 15, Ruddy. Difficult to hold.

Date.	Julian Date.	Inst.	Observer.	Comparisons.
1922 Nov				
18	3377	100	Lp	=44
21	3380	...	Gi	=40
24	3383	100	Lp	=51
Dec				
6	3395	193	Li	<40
7	3396	...	Gi	=63
19	3408	193	Li	<52
20	3409	100	Lp	<58
22	3411	193	Li	<62
23	3412	150	Lp	58−2
1923 Jan				
6	3426	193	Li	<58
9	3429	100	Lp	58−3
13	3433	157	Wf	63−6·5
14	3434	150	Lp	<55
14	3434	193	Li	<62
16	3436	150	Lp	<58
18	3438	117	Gi	63 (4·5) v (1·5) 64
20	3440	150	Lp	<55
20	3440	94	Li	=62
23	3443	157	Wf	63−5
Feb				
4	3455	100	Lp	<40
5	3456	94	Li	=62
7	3458	157	Wf	49−4, 58+1
Mar				
2	3481	44	Li	<36
5	3484	94	,,	=36
13	3492	117	Gi	21 (3·5) v (2) 35, 31+1·5
18	3497	94	Li	21 (5) v (5) 33, 23 (3) v (7) 31
18	3497	50	Bn	21 (2) v (1) 23
24	3503	120	,,	9 (1) v (2) 11
28	3507	117	Gi	5 (5) v (2) 9
Apr				
4	3514	50	Bn	5 (1) v (1) 9
6	3516	62	Wf	5−1, 9+4
7	3517	47	Gi	4 (2) v (1) 5
8	3518	34	Li	=5
8	3518	37	Lp	4 (2) v (2) 5
8	3518	30	Bn	5 (1) v (4) 9
13	3523	75	,,	=5
14	3524	37	Lp	4 (2) v (2) 5
15	3525	62	Wf	5−1, 9+5
19	3529	34	Li	5 (1) v (9) 9
20	3530	30	Bn	4 (2) v (1) 5
25	3535	117	Gi	5+1
26	3536	75	Bn	5+0·5
July				
8	3609	157	Wf	<58
9	3610	117	Gi	=62

Dec. 20, Not seen.
Dec. 23, Seen by flashes.
Jan. 9, Glimpsed.
Jan. 14, 16, Lp, Not seen.

(1222) R PERSEI—*continued.*

1923						1924							
July						Jan							
19	3620	157	Wf	63−4	14·0	25	3810	90	Bh	40−3	12·6*b*
20	3621	94	Li	<62	<13·6	25	3810	120	Bn	49−4, 53−2	13·2*b*
Aug						26	3811	90	Bh	=40	12·3
6	3638	157	Wf	71−3	14·8	31	3816	,,	,,	40 (1) v (2) 51	12·5
12	3644	,,	,,	<63	<13·6*b*	Feb					
17	3649	,,	,,	63−1, 66+1	13·9	1	3817	200	Bn	58−2	13·4*b*
Sept						1	3817	150	Wf	<58	<13·2*b*
5	3668	,,	,,	40−5, 58+4	12·8	1	3817	94	Bl	Estimated	<13·0
5	3668	150	Lp	=58	13·2*c*	3	3819	150	Lp	=62	13·6*b*
8	3671	120	Bn	40 (3) v (1) 49	12·7	4	3820	90	Bh	=51	12·9*b*
13	3676	150	Wf	=40	12·3	8	3824	157	Wf	62−3, 63−2	13·8
15	3678	120	Bn	40 (3) v (2) 49	12·6	14	3830	90	Bh	51−3	13·2*b*
15	3678	,,	Br	=53	13·1	14	3830	94	Bl	Estimated	<13·5
17	3680	150	Lp	36 (4) v (1) 40	12·2*b*	20	3836	,,	,,	,,	<13·0
29	3692	120	Bn	36 (3) v (2) 40	12·2	24	3840	90	Bh	51 (1) v (1) 58	13·0
30	3693	94	Li	=36	12·0*b*	26	3842	150	,,	<51	<12·9
30	3693	150	Wf	=36, 40+3	12·0	28	3844	94	Bl	62−1·5	13·7*b*
Oct						Mar					
4	3697	100	Lp	=34	11·7*b*	4	3849	120	Bn	49 (2) v (1) 58	13·0
9	3702	150	Wf	=34, 35+2	11·7	4	3849	150	Bh	<58	<13·2
13	3706	100	Lp	21 (2) v (2) 31	10·9*c*	9	3854	94	Bl	=58, =62	13·4*b*
15	3708	...	Gr	=21	10·4	20	3865	,,	,,	Estimated	<12·4
22	3715	100	Lp	=17	10·1*b*	24	3869	90	Bh	40 (1) v (1) 49	12·5
30	3723	150	Wf	=9	9·5	29	3874	120	Bn	40 (2) v (1) 49	12·6
Nov						29	3874	150	Lp	<40	<12·3*b*
1	3725	...	Gr	9−4, 17+1	10·0	29	3874	94	Bl	36 (4) v (1) 40	12·2
1	3725	45	Bh	5−8, 17+3	9·8	Apr					
3	3727	,,	,,	5 (1) v (1) 17, =9	9·5	1	3877	120	Bn	40 (1) v (3) 49	12·4
3	3727	100	Lp	=9	9·5	4	3880	,,	,,	40−1	12·4
4	3728	50	Bn	5 (1) v (1) 9	9·3	4	3880	150	Bh	=33, =36	11·9*b*
8	3732	45	Bh	5 (1) v (2) 17	9·4	7	3883	120	Bn	=35	11·8
8	3732	100	Lp	=9	9·5	7	3883	62	Wf	31−1, 33+4	11·4
13	3737	...	Gr	=9	9·5	17	3893	94	Bl	21 (3) v (2) 23	10·6
14	3738	50	Bn	5−2, 9+3	9·2	20	3896	120	Bn	17 (3) v (2) 21	10·3
14	3738	100	Lp	5 (1) v (2) 9	9·2*b*	24	3900	150	Wf	=17, 21+3	10·1
17	3741	,,	,,	5 (1) v (2) 9	9·2*b*	29	3905	62	,,	17−2, 21+0·5	10·3
17	3741	90	Bh	5−1, 9+4	9·1	May					
30	3754	45	,,	=5	9·0	1	3907	50	Bn	9 (1) v (2) 11	9·6*b*
30	3754	50	Bn	=9	9·5	5	3911	150	Wf	9−1	9·6*b*
Dec						10	3916	90	Bh	<11	< 9·9
2	3756	45	Bh	5 (1) v (2) 17	9·4	25	3931	,,	,,	<5	< 9·0
2	3756	100	Lp	5 (2) v (2) 9	9·3*b*	June					
3	3757	50	Bn	5 (3) v (1) 9	9·4	13	3950	45	,,	=4, 5+2	8·8*b*
4	3758	100	Lp	5 (2) v (2) 9	9·3*b*	23	3960	62	Wf	4+1, 5+3	8·7*b*
5	3759	45	Bh	=9	9·5	28	3965	,,	,,	5−1, 9+4	9·1
9	3763	,,	,,	=9	9·5*b*	July					
9	3763	100	Lp	5 (2) v (1) 9	9·3	1	3968	45	Bh	5 (1) v (1) 9	9·3
12	3766	45	Bh	9−2	9·7	5	3972	62	Wf	5−4, 9+1	9·4
15	3769	100	Lp	=17	10·1*b*	9	3976	90	Bh	9−1	9·6*b*
19	3773	45	Bh	=11	9·9	11	3978	62	Wf	9−2, 17+3	9·8
19	3773	120	Bn	17−1	10·2*b*	11	3978	50	Bn	5 (4) v (1) 9	9·4
23	3777	,,	,,	17 (7) v (1) 21	10·3	12	3979	94	Bl	9 (1·5) v (2·5) 11	9·7
23	3777	100	Lp	21−1	10·5*b*	19	3986	62	Wf	17−3, =21	10·4
28	3782	45	Bh	11−10, 21−5	10·9*b*	22	3989	,,	,,	21−4, 23−1	10·9
1924						22	3989	20	Wb	=21	10·4
Jan						23	3990	90	Bh	=11, =17	10·0
2	3787	100	Lp	36 (2) v (2) 40	12·1*b*	26	3993	,,	,,	17−2, =21	10·3
3	3788	90	Bh	33+5	11·2	27	3994	62	Wf	23−3, 31+1	11·2
6	3791	,,	,,	=31	11·3	29	3996	90	Bh	21−6, 33+8	11·0*b*
6	3791	150	Lp	40+1	12·2*b*	Aug					
6	3791	120	Bn	36 (2) v (1) 40	12·2	4	4002	157	Wf	40−1	12·4
17	3802	90	Bh	35+2, 36+4	11·6	6	4004	50	Wb	=40	12·3
20	3805	,,	,,	=35, =36	11·9						

July 19, Sept. 17, Oct. 4, 13, Difficult.
Sept. 5, Lp, Believed glimpsed. About.
Sept. 15, Br, About.

Feb. 3, Difficult.
Feb. 26, Mar. 4, May 10, Bh, Not seen.
Mar. 29, Lp, Not seen.
May 25, Not seen.

(1222) R PERSEI—*continued.*

1924						1924					
Aug						Nov					
7	4005	120	Bn	40+1	12·2	3	4093	94	Li	36 (5) v (5) 40	1
8	4006	90	Bh	=33, 36+2	11·8*b*	4	4094	,,	Bl	36 (3) v (1) 40	1
19	4017	,,	,,	=40	12·3	4	4094	75	Lp	33 (2) v (2) 40	1
22	4020	157	Wf	58−1, 62+3	13·3	4	4094	50	Wb	=33	1
26	4024	90	Bh	=51	12·9*b*	15	4105	94	Bl	23 (4) v (1) 31, =31	1
31	4029	,,	,,	=58	13·2*b*	15	4105	90	Bh	21−5, 33+5	1
31	4029	157	Wf	63−2, 64+2	13·7	24	4114	,,	,,	9 (1) v (1) 21	
Sept						24	4114	94	Li	=23	1
3	4032	90	Bh	=58	13·2	27	4117	50	Wb	17 (3) v (2) 21	1
5	4034	,,	,,	58 (1) v (1) 62	13·4*b*	27	4117	120	Bn	21−1, 23+4	1
12	4041	,,	,,	<58	<13·2*b*	27	4117	75	Lp	21−2	1
17	4046	,,	,,	58−2, =62	13·5	27	4117	94	Bl	17 (1) v (2) 21	1
20	4049	,,	,,	<58	<13·2	28	4118	90	Bh	=9	
23	4052	,,	,,	58 (2) v (1) 62, =62	13·5	30	4120	94	Li	=17	1
24	4053	150	Lp	<55	<13·1*b*	Dec					
27	4056	231	Wf	63−4, =64	13·9	3	4123	44	,,	=9	
27	4056	150	Bh	<62	<13·6	5	4125	50	Bn	5 (3) v (1) 9	
29	4058	94	Bl	58 (3) v (1) 62	13·5	6	4126	90	Bh	5 (1) v (1) 9	
Oct						9	4129	,,	,,	=5	
4	4063	94	Li	<62	<13·6	9	4129	34	Li	=5	
5	4064	157	Wf	63−3	13·9	13	4133	,,	,,	4 (5) v (5) 5	
5	4064	90	Bh	=58	13·2	14	4134	45	Bh	=4	
11	4070	94	Bl	Estimated	<12·6	14	4134	50	Bn	4+1, 5+4	
13	4072	90	Bh	51 (1) v (1) 58	13·0	14	4134	75	Lp	4 (2) v (1) 5	
17	4076	,,	,,	=51	12·9	15	4135	34	Li	3 (8) v (2) 4	
23	4082	150	Bn	40−1·5, 49+3	12·5	19	4139	90	Bh	5+1	
23	4082	94	Li	=40	12·3	22	4142	45	,,	=4	
24	4083	90	Bh	=40	12·3	22	4142	94	Bl	4+1, 5+3	
24	4083	94	Bl	=45	12·6	24	4144	90	Bh	5+1	
26	4085	,,	Li	=40	12·3	27	4147	45	,,	2 (4) v (1) 5	
28	4087	150	Lp	=40	12·3*c*	28	4148	75	Lp	=4	
28	4087	50	Wb	=40	12·3	30	4150	,,	,,	=4	
Nov						30	4150	45	Bh	2 (3) v (1) 5	
3	4093	120	Bn	36 (2) v (1) 40	12·2						

Sept. 12, 20, 27, Bh, Not seen.
Sept. 23, Difficult.
Sept. 24, Not seen.

Bh notes: "The colour from Dec. 6 w
orange-red, appearing to glint or tremb
It faded to dull yellow by 1925, Jan. 1

(5677) R SERPENTIS. (V. 1.)

H.D. 154615.

Star C = B.D. + 16° 2840, $6^m{\cdot}14$, **H.A., 50,** 136.
,, H = ,, + 16° 2837, 8·24, ,, **54,** 171.
,, K = ,, + 16° 2835, 8·51, ,, **54,** 171.
,, N = ϕ Serpentis, 5·74, ,, **45,** 195.

Hagen's (6+8) combined = $8^m{\cdot}87 + 9^m{\cdot}64 = 8^m{\cdot}43$.

Date.	Julian Date.	Inst.	Observer.	Comparisons.	Deduced Mag.
1920 Jan					
1	2325	30	Bn	7 (3) v (1) 9	9·8
5	2329	90	Bh	7−5, 10+5	9·8
8	2332	30	Bn	9+2·5	9·8
11	2335	94	Bl	7 (1) v (5) 9	9·4
13	2337	30	Bn	7 (2) v (1) 9	9·8
15	2339	90	Bh	7−3, 10+7	9·6*b*
16	2340	30	D	7−2	9·5*c*
19	2343	,,	Bn	7+1	9·2
21	2345	94	Bl	5 (7) v (3) 7	9·0
21	2345	45	Bh	7−1	9·4*b*
22	2346	90	,,	7+2	9·1
24	2348	,,	,,	5−4, 7+4	8·8
26	2350	50	Bn	7+2	9·1
27	2351	90	Bh	=5	8·4
31	2355	50	Bn	7+3	9·0
Feb					
2	2357	22	Bl	3 (6) v (1) 5	8·3
5	2360	,,	,,	3 (7) v (3) 7	8·7
5	2360	90	Bh	3−5, 5+5	7·9
11	2366	45	,,	3−2, 4−2	7·7
14	2369	22	Bl	2 (5) v (2) 4	7·3
15	2370	45	Bh	3+2	7·2
16	2371	30	D	3+3	7·1
17	2372	45	Bh	3+5	6·9*b*
18	2373	30	Bg	3−1	7·5*b*
21	2376	90	Wh	=2	6·8
22	2377	22	Bl	C (4) v (1) 2, =2	6·7*b*
23	2378	45	Bh	3+5	6·9
24	2379	55	Bg	3+1	7·3*b*
27	2382	45	Bh	3+7	6·7
28	2383	22	Bl	C (1·5) v (4·5) 2	6·3
29	2384	45	Bh	3+10	6·4
Mar					
4	2388	,,	,,	3+8	6·6
6	2390	F	Bn	C (1) v (2) 3	6·6
7	2391	45	Bh	3+8	6·6
11	2395	,,	,,	C−3, 3+10	6·4
11	2395	,,	Br	2+2, 3+10	6·5*b*
12	2396	F	Bg	=2	6·8
12	2396	30	Bn	=C	6·1
12	2396	F	Wh	=2	6·8
16	2400	62	Th	3+3	7·1
17	2401	90	Bh	3+8	6·6
18	2402	45	Br	2+2, 3+10	6·5
1920 Mar					
18	2402	30	Bn	C+1	6·0
18	2402	B	D	C−3	6·4*b*
18	2402	22	Bl	N (4·5) v (1·5) C	6·0
19	2403	F	Bg	=2	6·8
21	2405	B	D	C (3) v (2) 3	6·9*b*
22	2406	90	Bh	3+8	6·6
22	2406	30	Bn	C+1	6·0
22	2406	F	Wh	=2	6·8
23	2407	B	D	C (4) v (1) 3, 3+3	7·2
25	2409	45	Bh	2+5, 3+10	6·4
29	2413	22	Bl	C (2) v (5) 2	6·3
30	2414	B	D	C (2) v (1) 3, 3+5	7·0*b*
31	2415	45	Bh	2+5, 3+10	6·4
Apr					
10	2425	22	Bl	C (5) v (2) 2	6·6
11	2426	30	D	3+4	7·0
12	2427	,,	Bn	3+1·5	7·3*b*
12	2427	B	Bg	C−6, =2, 3+6	6·8*b*
12	2427	45	Bh	3+5, 4+5	7·0
13	2428	B	Ma	3+2	7·2*c*
15	2430	22	Bl	2 (1) v (6) 3	6·9
16	2431	30	D	3+1	7·3
16	2431	F	Bg	=2	6·8*b*
17	2432	45	Br	3+4	7·0
17	2432	90	Bh	3+3	7·1
17	2432	,,	Wh	=3	7·4
21	2436	F	Bg	2−4, 3+2	7·2
21	2436	30	Bn	3 (1) v (5) 5	7·6
21	2436	90	Bh	3+2	7·2
21	2436	30	D	=3	7·4*b*
21	2436	B	Ma	3 (3) v (1) 4	7·5*b*
27	2442	45	Br	3+1	7·3
27	2442	90	Bh	=3, =4	7·5
27	2442	22	Bl	3−2, =4	7·6
28	2443	30	Bn	3 (5) v (2) 5	8·1
29	2444	62	Th	3−1	7·5
29	2444	90	Wh	3 (1) v (2) 7	8·0
May					
2	2447	30	Bg	=3	7·4*b*
4	2449	22	Bl	4 (4) v (5) 6	7·9
4	2449	50	Ma	3−2·5, 4−1	7·6

Jan. 21, Bl, With 22, 9·0.
Feb. 16, With B, 7·2.
Mar. 18, Br, With B, 6·2.

Mar. 21, 30, D, Difficult.
Mar. 31, Orange.
April 11, With B, 7·2.
April 13, If rightly identified.
April 16, D, With B, 7·4.

(5677) R SERPENTIS—*continued.*

1920					
May					
4	2449	90	Bh	3−2, 5+6	7·7
7	2452	,,	,,	3−3	7·7
7	2452	50	Bn	3 (4) v (1) 5	8·2
7	2452	30	D	4−5, 5+4	8·0
7	2452	50	Ma	=3	7·4
7	2452	,,	Tm	3 (1) v (1) 5	7·9
9	2454	,,	,,	3 (2) v (3) 5	7·8
9	2454	90	Wh	3 (1) v (2) 7	8·0
9	2454	62	Th	3−3	7·7*b*
9	2454	50	Ma	3−3	7·7
9	2454	45	Br	3−5, 5+5	7·9
10	2455	55	Bg	3−5, 5+4	8·0
10	2455	50	Tm	3 (3) v (1) 5	8·2
12	2457	,,	,,	3 (3) v (1) 5	8·2
12	2457	30	D	4−7, 5+2	8·2
13	2458	90	Bh	3−4, 5+5	7·9
14	2459	50	Bn	3 (5) v (1) 5	8·2
14	2459	,,	Ma	3 (1) v (2) 5	7·8
15	2460	22	Bl	3 (4·5) v (2·5) 5	8·1
17	2462	90	Bh	3−6, 5+3	8·1
17	2462	,,	Wh	3 (2) v (1) 7	8·6
18	2463	50	Ma	5+2	8·2*b*
18	2463	30	D	4 (5) v (1) 5, 5+2	8·2*b*
19	2464	55	Bg	5−1·5, 6+3	8·6
21	2466	22	Bl	=5	8·4
21	2466	30	D	7+0·5	9·2*b*
21	2466	50	Bn	5+0·5	8·4
22	2467	45	Br	5+1	8·3
22	2467	50	Ma	5−1	8·5
23	2468	45	Bh	5+2	8·2
23	2468	50	Tm	3 (9) v (1) 5, =5	8·3
26	2471	55	Bg	5−3, 6+1·5	8·7
29	2474	50	Bn	5 (1) v (4) 7	8·6
29	2474	,,	Tm	5 (1) v (3) 7	8·6*b*
June					
2	2478	90	Bh	=5	8·4
3	2479	50	Ma	5 (3) v (1) 7	9·0
4	2480	90	Bh	5−2, 7+6	8·6
4	2480	,,	Wh	7 (1) v (1) 9	9·6
5	2481	45	Br	5−6, 7+3	9·0
6	2482	50	Bn	7+1	9·2
7	2483	90	Wh	=7	9·3
8	2484	,,	Bh	7+2	9·1
8	2484	30	D	7−3, 9+2	9·7*b*
8	2484	22	Bl	5 (5) v (2) 7	9·0
9	2485	55	Bg	7−1, 9+7	9·3
11	2487	30	D	9−2, 10+1	10·2
14	2490	50	Tm	7−0·5	9·3
14	2490	,,	Ma	7 (1) v (2) 10	9·6
15	2491	90	Bh	7−2, 9+6	9·4
18	2494	,,	,,	7−3, 9+5	9·5
18	2494	22	Bl	7 (2) v (5) 10	9·5
19	2495	45	Br	7−2, 9+5	9·5
19	2495	55	Bg	=9, 10+3	10·0*b*
22	2498	50	Ma	7 (1) v (1) 10	9·8
23	2499	,,	Tm	7 (1) v (3) 10	9·5*b*
23	2499	55	Bg	9−2, 10+1	10·2
23	2499	90	Bh	7−4, 9+4	9·6
29	2505	,,	,,	10+3	10·0
30	2506	94	Bl	7 (6) v (4) 10	9·9
July					
3	2509	55	Bg	10−4, 13+2	10·7
11	2517	90	Bh	10−2	10·5
12	2518	30	D	<10	<10·3
13	2519	55	Bg	12−4, 15+2	11·1*b*

June 8, D, Difficult.

1920					
July					
14	2520	94	Bl	12 (1) v (2) 13	10·8
15	2521	120	Bn	13 (3) v (1) 15	11·2
15	2521	90	Bh	10−4, 12+1	10·6
17	2523	160	Br	15+1	11·2
18	2524	79	Ma	=16	11·3
18	2524	90	Wh	=17	11·6
24	2530	94	Bl	15 (1) v (1) 17	11·5
24	2530	79	Ma	15 (3) v (1) 17	11·5
24	2530	120	Bn	15−1·5	11·5
28	2534	79	Ma	15 (3) v (1) 17	11·5*b*
30	2536	120	Br	=19	12·1*b*
30	2536	90	Bh	=15, =16	11·3
Aug					
1	2538	79	Ma	=17	11·6*b*
5	2542	,,	,,	17 (1) v (3) 22, 17−1	11·8
6	2543	160	Br	19+1	12·0
6	2543	75	Bn	18 (2) v (1) 20	12·1*b*
6	2543	90	Bh	15−1, 17+1	11·5
8	2545	,,	Wh	=22	12·6
8	2545	,,	Bh	15−2, 17−1	11·6
10	2547	79	Ma	15 (1) v (1) 22	12·0
12	2549	94	Bl	=12	12·2*b*
13	2550	90	Bh	19−2, =20, 21+1	12·3
15	2552	79	Ma	17 (3) v (1) 22	12·3
15	2552	75	Bn	=21	12·4*b*
18	2555	90	Bh	=21, =22	12·5*b*
22	2559	183	Ma	=22	12·6*b*
Sept					
4	2572	90	Bh	21−2, =22	12·6
6	2574	150	Tn	23+2	13·1
8	2576	,,	,,	23+2	13·1
11	2579	120	Br	22−5, 23+2·5	13·1
13	2581	150	Bh	20−5, 22−2	12·7
13	2581	,,	Tn	=23	13·3
16	2584	94	Bl	25 (1·5) v (4·5) 27	13·5
19	2587	90	Bh	22−3	12·9
19	2587	150	Tn	23−2	13·5
26	2594	120	Br	<19	<12·1
Oct					
1	2599	,,	,,	=23	13·3
1	2599	90	Bh	22−5	13·1
6	2604	,,	,,	22−5, 23+2	13·1
18	2616	150	,,	22−5, 23+2	13·1
18	2616	120	Br	=23	13·3*b*
29	2627	94	Bl	=23	13·3*b*
30	2628	150	Bh	22−5	13·1
Nov					
20	2649	90	,,	21−6, 22−4	13·0
30	2659	,,	,,	22−2, 23+5	12·8*b*
Dec					
12	2671	,,	,,	20−2, =21, 22+2	12·4
21	2680	,,	,,	21+1, 22+4	12·2*b*
25	2684	,,	,,	21+1	12·3*b*
31	2690	,,	,,	17−3, 21+4	11·9
1921					
Jan					
7	2697	,,	,,	=16, =15, 17+2	11·3
10	2700	,,	,,	=15	11·3
10	2700	75	Bn	13 (3) v (1) 16, 15+1	11·2
13	2703	,,	,,	13 (2) v (1) 15	11·2
13	2703	90	Bh	9−10, 15+3	11·0

July 30, Oct. 1, Br, About.
Sept. 13, 19, Tn, Glimpsed.
Sept. 19, Bh, 23 not seen.
Sept. 26, Not seen.
Oct. 18, Br, About. Difficult.
Nov. 20, 23, Not seen.

(5677) R SERPENTIS—*continued.*

1921					
Jan					
14	2704	94	Bl	13 (2) v (2) 15	11·1
30	2720	90	Bh	5−2	8·6
31	2721	50	Bn	5 (2) v (1) 7	9·0
Feb					
2	2723	45	Bh	5+1	8·3
9	2730	90	,,	3−3	7·7
16	2737	22	Bl	=3, 4+1	7·4
17	2738	50	Bn	3 (1) v (3) 5	7·7
17	2738	30	D	4−1	7·6*b*
17	2738	45	Bh	3+2	7·2
21	2742	90	,,	=3, =4	7·5
23	2744	22	Bl	2 (2·5) v (1·5) 3, 2 (2·5) v (1·5) 4	7·2
25	2746	45	Bh	=3, =4	7·5*b*
Mar					
2	2751	90	,,	3+1, 4+1	7·4
2	2751	50	Bn	3+1	7·3
2	2751	22	Bl	2 (2) v (2) 3	7·1
4	2753	32	Ca	3+1	7·3
6	2755	45	Bh	3+1, 4+1	7·4
10	2759	22	Bl	2 (2·5) v (1·5) 3, 2 (2·5) v (1·5) 4	7·2
11	2760	90	Bh	=3, =4	7·5
13	2762	45	Br	3+2	7·2
14	2763	50	Bn	3−1	7·5
14	2763	45	Bh	=3, =4	7·5
16	2765	,,	,,	=3, =4	7·5
18	2767	50	Bn	3−2, =4	7·6
20	2769	45	Br	=3	7·4
20	2769	22	Bl	=3, 4+1	7·4
21	2770	45	Bh	=3, =4	7·5
24	2773	,,	,,	=3, 4+1	7·4
29	2778	90	,,	3−2	7·6
30	2779	55	Bg	3−3, 5+7	7·7*b*
30	2779	50	Bn	3 (1) v (2) 5	7·8
Apr					
1	2781	45	Bh	=3, =4	7·5
1	2781	22	Bl	3 (2) v (6) 5	7·7
3	2783	30	D	4−3, 5+5	7·8
4	2784	45	Br	5+2	8·2
4	2784	,,	Bh	=3, =4	7·5
6	2786	30	Bn	3 (7) v (1) 5	8·3
7	2787	55	Bg	3−3, 5+7	7·7*b*
7	2787	90	Bh	3−3, 5+7	7·7
8	2788	30	D	4 (3) v (1) 5, 5+3	8·1
11	2791	,,	,,	4 (4) v (1) 5, 5+1	8·2
11	2791	22	Bl	3 (7) v (1) 5, 4 (7) v (1) 5	8·3
12	2792	75	Bn	5+2·5	8·2
12	2792	45	Bh	3−5, 5+5	7·9
15	2795	30	D	4 (5) v (1) 5, 5+1	8·3
16	2796	22	Bl	5+0·5	8·4*b*
19	2799	90	Bh	3−7, 5+3	8·1
23	2803	45	,,	5+2	8·2
25	2805	,,	,,	5+1	8·3
27	2807	22	Bl	5 (2) v (5) 7	8·6
27	2807	30	D	5−5, 7+4	8·9
27	2807	50	Bn	7+2	9·1
28	2808	55	Bg	6−1, 7+2·5	9·0
28	2808	45	Br	5−2, 6+2	8·6
29	2809	,,	Bh	=5	8·4
29	2809	30	D	5−6, 7+3	9·0
May					
1	2811	50	Bn	7+1·5	9·1
1	2811	,,	Ma	5−1	8·5
7	2817	45	Bh	5−3, 7+5	8·7
8	2818	50	Bn	7+1	9·2
8	2818	55	Bg	=7	9·3
1921					
May					
9	2819	45	Bh	5−5, 7+3	8·9
12	2822	22	Bl	=7	9·3*b*
14	2824	55	Bg	7−2, 9+6	9·4
15	2825	90	Bh	=7	9·3
16	2826	30	D	5−6, 7+2	9·0*b*
21	2831	50	Bn	7−1	9·4
23	2833	,,	,,	7 (1) v (3) 9	9·4
23	2833	,,	Ma	=7	9·3
23	2833	45	Bh	7+1	9·2
24	2834	,,	,,	=7	9·3
24	2834	55	Bg	7−2·5, 9+5·5	9·5
27	2837	22	Bl	7 (1) v (4) 10, =7	9·4*b*
29	2839	30	D	7 (3) v (2) 10, 10+5	9·8
31	2841	22	Bl	7 (1) v (6) 9	9·4
June					
1	2842	55	Bg	7−5, 9+3	9·7
1	2842	45	Br	=7	9·3
2	2843	90	Bh	7−2, 9+2	9·6
5	2846	30	D	7 (3) v (1) 10, 10+3	10·0
6	2847	75	Bn	9 (1) v (1) 10	10·2
9	2850	55	Bg	7−6, 9+2	9·8*b*
10	2851	90	Bh	9+1, 10+4	9·9
11	2852	50	Bn	9 (1) v (2) 10	10·1
11	2852	,,	Ma	5 (3) v (1) 10	9·8
11	2852	22	Bl	9 (2) v (1) 10	10·2
16	2857	55	Bg	=9	10·0*b*
23	2864	,,	,,	10−2, 12+2	10·5
23	2864	50	Bn	10 (2) v (1) 12	10·5
24	2865	94	Bl	9+0·5	10·0*b*
27	2868	160	Br	12−1, 13+1	10·8
27	2868	90	Bh	9−1	10·1*b*
28	2869	50	Bn	13 (1) v (2) 15	11·1
28	2869	60	D	13−1, 15+3	11·0
28	2869	94	Bl	9−3, =10	10·3
July					
4	2875	60	D	13−5, 17+1·5	11·4*b*
4	2875	32	Ca	=9	10·0*b*
5	2876	50	Ma	12−2·5, 15+1	11·1
5	2876	55	Bg	12−4, 15+2	11·1
5	2876	50	Bn	13 (3) v (1) 15	11·2
8	2879	94	Bl	12 (2) v (1) 13	10·8
9	2880	120	Bn	15+1	11·2
11	2882	90	Bh	9−6, 10−3	10·6
18	2889	,,	,,	10−6, 15+3	11·0
25	2896	120	Bn	17 (2) v (1) 18	11·8
31	2902	94	Bl	=18	12·0
Aug					
1	2903	55	Bg	17−3, 20+3	11·9
3	2905	79	Ma	15−4, 17−3	11·8
6	2908	90	Bh	16−6, 18−2, =20	12·1
8	2910	55	Bg	=20	12·2*b*
25	2927	90	Bh	20−5	12·7
27	2929	94	Bl	22 (1) v (6) 23	12·7
30	2932	120	Br	19−2, 22+2	12·3
30	2932	90	Bh	22−3, 23+5	12·8
Sept					
5	2938	,,	,,	22−7, 23+3	13·1
5	2938	94	Bl	22 (3) v (4) 23	12·9
10	2943	120	Br	22−3	12·9
21	2954	150	Bh	23−1	13·4
22	2955	120	Bn	<22	<12·6

June 2, Yellow.
June 28, Bl, With 22, 10·8.
July 4, D, Difficult.
Aug. 8, About.
Sept. 10, Br, About.
Sept. 22, Not seen.

(5677) R SERPENTIS—*continued.*

1921					
Sept					
24	2957	120	Br	22−3, 23+3	12·9*b*
29	2962	48	Bg	<20	<12·2*b*
Oct					
1	2964	94	Bl	22 (5) v (1) 23	13·2*b*
1	2964	120	Br	22−5	13·1*b*
5	2968	90	Bh	=23	13·3
17	2980	94	Bl	<23	<13·3
23	2986	150	Bh	23+2	13·1
23	2986	120	Br	=23	13·3
23	2986	150	Tn	=23	13·3
Nov					
4	2998	120	Br	<22	<12·6*b*
6	3000	,,	,,	22−4, 23+2	13·0
12	3006	90	Bh	20−3, 22−1	12·6
25	3019	,,	,,	17−7, 22+3	12·3
29	3023	,,	,,	18+1, 20+2	11·9
Dec					
15	3039	,,	,,	10−5, 15+5	10·8
25	3049	,,	,,	=9, 10+2	10·1
26	3050	,,	,,	9+1, 10+2	10·0
30	3054	,,	,,	9+2, 10+4	9·9
1922					
Jan					
3	3058	30	Bn	7 (3) v (1) 9	9·8
3	3058	45	Bh	7−5, 10+5	9·8
10	3065	,,	,,	=7	9·3
18	3073	,,	,,	5−6, 7+3	9·0
20	3075	90	,,	=5	8·4
22	3077	,,	,,	5+1	8·3
23	3078	22	Bl	4 (7) v (1) 5	8·3
Feb					
1	3087	,,	,,	2 (4·5) v (1·5) 3	7·3
2	3088	90	Bh	3−6, 5+4	8·0
5	3091	45	,,	3−5, 5+5	7·9*b*
14	3100	22	Bl	C (2) v (3) 2	6·4
17	3103	45	Bh	3−3, 5+6	7·8
20	3106	,,	,,	=3, =4	7·5
20	3106	30	D	2+5	6·3
21	3107	22	Bl	=C, 2+5	6·2
26	3112	45	Bh	3+1, 4+1	7·4
27	3113	32	Ca	3+4	7·0
Mar					
4	3118	45	Bh	3+2, 4+2	7·3
9	3123	22	Bl	C (3) v (4) 2	6·4
10	3124	45	Bh	3+2	7·2
11	3125	,,	Br	3+4	7·0
15	3129	90	Bh	3+2, 4+2	7·3
17	3131	22	Bl	2 (1) v (4) 3	6·9*b*
19	3133	32	Ca	3+3	7·1
19	3133	45	Bh	3+3, 4+3	7·2
25	3139	,,	Br	3+1	7·3
25	3139	30	Bn	3+1	7·3
28	3142	90	Bh	3+1, 4+1	7·4
31	3145	45	,,	=3, =4	7·5
Apr					
1	3146	50	Bn	3+1	7·3
2	3147	55	Bg	3−2, 5+8	7·6
2	3147	22	Ca	3+2	7·2
4	3149	45	Bh	=3, =4	7·5
6	3151	22	Bl	4 (1) v (7) 5	7·6
9	3154	90	Bh	=3, =4	7·5
17	3162	,,	,,	3−2	7·6

Oct. 1, 23, Br, About.
Oct. 23, Tn, Glimpsed.
Nov. 4, Not seen.
Nov. 6, Seen clearly.
Feb. 20, D, With B, 6·4.

1922					
Apr					
17	3162	32	Ca	3−1, 5+9	7·5
19	3164	55	Bg	3−6, 5+3	8·1
19	3164	30	Bn	3 (5) v (2) 5	8·1
19	3164	22	Bl	4 (6) v (1) 5	8·3
23	3168	90	Bh	3−4, 5+6	7·8
26	3171	32	Ca	4−3, 5+6	7·8
27	3172	30	Bn	5+1	8·3
28	3173	22	Bl	5+1·5, (6+8)+0·5	8·3
29	3174	45	Br	=5	8·4
29	3174	90	Bh	3−5, 5+5	7·9
May					
2	3177	,,	,,	5+2	8·2
2	3177	50	Bn	5+1·5	8·3
4	3179	55	Bg	5−3, 6+1	8·7
8	3183	32	Ca	5−1	8·5
8	3183	45	Bh	5−1	8·5*b*
12	3187	,,	,,	5−2	8·6
13	3188	55	Bg	6−2, 7+2	9·1*b*
15	3190	50	Bn	5 (3) v (1) 7	9·0
15	3190	37	Lp	5 (2) v (2) 7	8·8
17	3192	90	Bh	5−6, 7+3	9·0
18	3193	32	Ca	5−4	8·8
20	3195	31	D	5 (4) v (1) 7, 7+2	9·1
20	3195	37	Lp	5 (3) v (2) 7	8·9*b*
20	3195	22	Bl	5 (7) v (2) 7	9·1
21	3196	55	Bg	6−2·5, 7+1·5	9·1
21	3196	50	Bn	7+1	9·2
23	3198	37	Lp	5 (3) v (2) 7	8·9
25	3200	45	Br	7+2	9·1
26	3201	55	Bg	=7	9·3*b*
26	3201	45	Bh	7+1	9·2
28	3203	22	Bl	5 (6) v (1) 7	9·1
28	3203	37	Lp	=7	9·3*b*
28	3203	31	D	7−4, 10+6	9·7
31	3206	32	Ca	9+2	9·8
June					
1	3207	50	Bn	7 (1) v (2) 10	9·6
4	3210	45	Bh	7−2, 9+6	9·4
6	3212	50	Bn	7 (2) v (1) 10	9·9
7	3213	55	Bg	7−4, 9+4	9·6
12	3218	90	Bh	9+2, 10+5	9·8
15	3221	94	Bl	7 (6) v (2) 9	9·8
19	3225	90	Bh	=9, =10	10·2*b*
23	3229	55	Bg	7−7, 9+1	9·9*b*
28	3234	50	Ma	=10	10·3
29	3235	94	Bl	10+2	10·1
29	3235	90	Bh	10−2	10·5*b*
July					
2	3238	,,	,,	9−8, 10−5	10·8
10	3246	,,	,,	15+3, 17+6	11·0
10	3246	160	Br	13−1, 15+3	11·0
12	3248	22	Bl	14 (2) v (2) 15	11·2
18	3254	50	Bn	=16	11·3
20	3256	,,	,,	15 (2) v (1) 17	11·5
20	3256	90	Bh	=15, =16, =17	11·4*b*
20	3256	55	Bg	=15	11·3
21	3257	160	Br	=17	11·6
27	3263	90	Bh	17−2, 18+2	11·8
28	3264	120	Bn	17 (3) v (2) 22	12·2
30	3266	37	Lp	=19	12·1*c*
30	3266	160	Br	=17	11·6
31	3267	90	Bh	<18	<12·0

May 28, Lp, Doubtful comparison.
June 29, Bl, With 22, 10·3.
July 30, Lp, Seen by glimpses.
July 31, Not seen.

(5677) R SERPENTIS—*continued.*

1922 Aug					
11	3278	90	Bh	=20, 21+1	12·2*b*
16	3283	55	Bg	20−2, 22+2	12·4*b*
17	3284	90	Bh	=21, =22	12·5
20	3287	,,	,,	21−3, =22	12·6
20	3287	79	Ma	22−3	12·9
23	3290	150	Bh	22−2, 23+6	12·7
25	3292	,,	,,	22−5, 23+3	13·0
25	3292	120	Br	22−1	12·7
29	3296	90	Bh	<22	<12·6
31	3298	150	,,	22−4, 23+4	12·9
Sept					
10	3308	90	,,	<22	<12·6
15	3313	150	,,	22−6, 23+2	13·1
15	3313	160	Br	22−6, 23+2	13·1*b*
18	3316	94	Bl	22 (6) v (1) 23	13·2
20	3318	120	Bn	<22	<12·6
21	3319	150	Bh	22−6, 23+2	13·1
24	3322	120	Bn	<22	<12·6
Oct					
4	3332	90	Bh	Estimated	<13·0
6	3334	94	Bl	Estimated	<12·9
14	3342	120	Br	<22	<12·6*b*
18	3346	94	Bl	22 (4) v (2) 23	13·1*b*
20	3348	90	Bh	<22	<12·6*b*
21	3349	120	Br	22+1	12·5*b*
25	3353	150	Bh	=22	12·6
Nov					
1	3360	120	Br	19−4	12·5*b*
11	3370	,,	,,	19−2, 22+3	12·3
14	3373	90	Bh	=18, =20	12·1
24	3383	150	,,	=15, =16	11·3
Dec					
6	3395	90	,,	9−5, =10	10·4
11	3400	,,	,,	=9, =10	10·2*b*
16	3405	,,	,,	7−6, 10+4	9·9
20	3409	75	Bn	9 (1) v (2) 10	10·1
23	3412	90	Bh	7−4, 10+6	9·7
25	3414	,,	,,	7−3	9·6*b*
1923 Jan					
4	3424	,,	,,	7+1	9·2
5	3425	40	Ry	5−8, 7−0·5, 9+5	9·3
11	3431	90	Bh	5−6, 7+3	9·0
14	3434	22	Bl	=5	8·4
20	3440	30	Bn	3 (5) v (1) 5	8·2
27	3447	90	Bh	3−1	7·5
Feb					
1	3452	45	,,	3+2	7·2*b*
4	3455	90	,,	3+1, 4+1	7·4
8	3459	45	,,	3+2, 4+2	7·3
13	3464	22	Bl	2 (1) v (4) 3	6·9
16	3467	45	Bh	3+2, 4+2	7·3
21	3472	37	Lp	2 (2) v (2) 3	7·1*b*
23	3474	45	Bh	3+2, 4+2	7·3
Mar					
2	3481	90	,,	3+1, 4+1	7·4
8	2487	,,	,,	3+2, 4+2	7·3
13	3492	45	,,	3+2, 4+2	7·3
17	3496	90	,,	3+1, 4+1	7·4
17	3496	,,	Wh	=3	7·4
1923 Mar					
17	3496	30	Bn	3+1	7·3
18	3497	55	Bg	3−1	7·5*b*
19	3498	31	D	C (4) v (1) 3, 3+3	7·2
21	3500	90	Bh	3+1	7·3
24	3503	22	Bl	2 (2) v (2) 3	7·1
25	3504	90	Wh	3+4	7·0
25	3504	,,	Bh	3+1	7·3
27	3506	45	,,	3+2, 4+2	7·3
Apr					
4	3514	22	Bl	4 (1) v (6) 5	7·6
4	3514	55	Bg	3−2, 5+7	7·7*b*
4	3514	50	Bn	4 (1) v (3) 5	7·7
8	3518	37	Lp	=4	7·5*b*
8	3518	90	Wh	=3	7·4
8	3518	,,	Bh	=3, =4	7·5
13	3523	,,	,,	3−4	7·8
13	3523	30	Bn	3 (4) v (1) 5	8·2
13	3523	37	Lp	3 (2) v (2) 5	7·9
14	3524	55	Bg	3−4, 5+5	7·9
14	3524	50	Ma	3 (2) v (1) 5	8·1
15	3525	30	D	3 (1) v (5) 5, 3−2	7·6
19	3529	,,	,,	3−6, 5+4	8·0
20	3530	22	Bl	4 (4) v (4) 5	7·9
20	3530	55	Bg	3 (4) v (1) 5	8·2*b*
22	3532	90	Bh	3−7, 5+3	8·1
23	3533	30	D	3 (3) v (1) 5, 5+3	8·1
24	3534	,,	Bn	5+1	8·3
26	3536	37	Lp	3 (4) v (1) 5	8·2*b*
27	3537	30	D	3 (4) v (1) 5, 5+2	8·2
May					
1	3541	90	Bh	5+1	8·3*b*
2	3542	50	Wb	5 (1) v (4) 7	8·6
3	3543	,,	,,	5 (1) v (4) 7, 5 (2) v (3) 7	8·7
3	3543	55	Bg	=6, 7+3	8·9
3	3543	37	Lp	5 (1) v (2) 7	8·7
3	3543	45	Br	5−1	8·5
4	3544	75	Bn	5 (2) v (1) 7	9·0
5	3545	30	D	=5	8·4
5	3545	37	Lp	5 (1) v (2) 7	8·7*b*
8	3548	90	Bh	5−1	8·5*b*
9	3549	45	Br	5−1	8·5
9	3549	50	Wb	5 (3) v (2) 7	8·9
10	3550	22	Bl	=5	8·4*b*
11	3551	37	Lp	5 (1) v (2) 7	8·7
12	3552	48	Bg	6 (1) v (2) 7	9·0
13	3553	30	D	=5	8·4
15	3555	50	Bn	5 (4) v (1) 7	9·1
15	3555	,,	Wb	5 (2) v (3) 7	8·7
16	3556	37	Lp	5 (4) v (1) 7	9·1*b*
17	3557	50	Wb	5 (2) v (3) 7	8·7
17	3557	90	Bh	5−6, 7+3	9·0
24	3564	30	D	5−6, 7+2·5	9·0
24	3564	22	Bl	5 (6) v (1) 7	9·1
25	3565	37	Lp	=7	9·3*b*
26	3566	50	Wb	5 (3) v (2) 7	8·9
30	3570	90	Bh	7+1	9·2
June					
2	3573	,,	,,	7−4, 9+4	9·6
2	3573	,,	Wh	=9	10·0
4	3575	30	D	7−4, 10+6	9·7*b*
6	3577	60	,,	7−3, 10+7	9·6
6	3577	94	Bl	5 (6) v (1) 7	9·1
7	3578	50	Wb	7 (3) v (2) 10	9·9

Sept. 10, Oct. 4, 20, Not seen.
Sept. 20, Perhaps seen.
Sept. 24, Seen.
Oct. 21, About. Very difficult.
Nov. 1, About. Difficult.
Nov. 11, Difficult.

Mar. 19, 7c.
June 6, Bl, With 22, 9·4.

(5677) R SERPENTIS—*continued.*

1923 June					
10	3581	37	Lp	7 (2) v (2) 10	9·8*c*
10	3581	30	D	7−5, 10+5	9·8
11	3582	50	Wb	9 (2) v (3) 10	10·1
17	3588	37	Lp	7 (4) v (1) 10	10·1*b*
18	3589	94	Bl	7 (6) v (1) 9	9·9
18	3589	30	D	10+2	10·1
21	3592	90	Bh	7−8, =9	10·0
22	3593	100	Lp	10 (1) v (4) 12	10·4*b*
23	3594	45	Br	7−6, 10+4	9·9
23	3594	90	Bh	9−3, =10	10·3
29	3600	55	Bg	10 (1) v (1) 13	10·6*b*
July					
2	3603	100	Lp	10 (4) v (1) 12	10·6*b*
4	3605	...	Gr	=10	10·3
5	3606	90	Bh	10−2	10·5
5	3606	94	Bl	9 (2) v (1) 10, =10	10·2*b*
6	3607	60	D	10+1	10·2
6	3607	,,	Ga	10−5, =12	10·7
6	3607	50	Bn	9 (2) v (1) 10	10·2
7	3608	,,	Gr	10−3, 13+3	10·6
8	3609	100	Lp	11 (1) v (2) 15	11·0*b*
8	3609	50	Wb	9 (3) v (1) 10	10·2*b*
10	3611	94	Bl	9 (2) v (1) 10	10·2
12	3613	100	Lp	11 (2) v (2) 15	11·1*b*
13	3614	55	Bg	12 (1) v (3) 15	10·8
13	3614	50	Gr	12−1, 13+1	10·8
13	3614	,,	Wb	10 (3) v (2) 13	10·7
16	3617	60	Ga	=14	11·1
18	3619	100	Lp	11 (7) v (3) 15	11·2*b*
20	3621	50	Bn	13 (3) v (2) 15	11·2
20	3621	90	Bh	10−4	10·7
21	3622	44	Li	=13	10·9
30	3631	50	Gr	15−1, 17+2	11·4
31	3632	90	Bh	16+5, 15+3	10·9
Aug					
1	3633	,,	,,	10−10, 15+2	11·2
1	3633	120	Ga	=15	11·3
3	3635	90	Bh	=15, =16	11·3
3	3635	75	Bg	=17	11·6
3	3635	160	Br	17−3, 19+3	11·8
3	3635	51	Ma	=15	11·3*b*
3	3635	90	Wh	=17	11·6
4	3636	120	Bn	18 (1) v (1) 20	12·1
8	3640	55	Bg	17 (1) v (2) 20	11·8
9	3641	90	Bh	17−2	11·8
10	3642	120	Ga	17−5, 22+2	12·2
11	3643	,,	Bn	18 (2) v (1) 20	12·1
11	3643	100	Lp	=19	12·1*b*
13	3645	,,	,,	=19	12·1
15	3647	51	Ma	15−3, 17−5, =20	12·0*b*
15	3647	90	Bh	15−7, 17−5	12·1
15	3647	OG	Ph	=21, 22+1	12·4
26	3658	90	Bh	=20	12·2
Sept					
1	3664	160	Br	22−3	12·9
2	3665	90	Bh	20−1, 22+2	12·3
5	3668	120	Bn	22 (1) v (1) 23	12·9
5	3668	OG	Ph	21−3, 22 (1) v (1) 23	12·9
5	3668	79	Ma	=22	12·6
6	3669	,,	,,	22 (1) v (2) 23	12·8
6	3669	94	Bl	22 (1) v (6) 23	12·7
1923 Sept					
6	3669	OG	Ph	22 (1) v (1) 23, 25+4	13
7	3670	90	Bh	20−7, 22−3	12
10	3673	160	Br	22−2·5, 23+5	12·
10	3673	OG	Ph	22 (1) v (1) 23, 25+5	13·
11	3674	120	Bn	22 (2) v (1) 23	13·
13	3676	90	Bh	22−3, 23+5	12·
15	3678	94	Bl	22 (5) v (1) 23	13·
15	3678	120	Bn	22 (3) v (1) 23	13·
16	3679	OG	Ph	22−5, =23	13·
16	3679	90	Bh	22 (1) v (1) 23	12·
29	3692	120	Br	=23	13·
29	3692	,,	Bn	22 (3) v (1) 23	13·
30	3693	90	Bh	20−7, 22−5	13·
Oct					
1	3694	150	,,	23+2	13·
5	3698	,,	,,	22−6, 23+2	13·
9	3702	,,	,,	22−4, 23+2	13·
12	3705	120	Br	22−5, 23+2·5	13·
14	3707	,,	Bn	<22	<12·
19	3712	90	Bh	<22	<12·
28	3721	120	Bn	20 (3) v (1) 22	12·
31	3724	,,	Br	15−10, 20−4	12·
Nov					
4	3728	,,	Bn	20−3, 22+1	12·
5	3729	160	Br	19−2	12·
7	3731	120	Bn	=20	12·
9	3733	90	Bh	<20	<12·
14	3738	120	Bn	17−4	12·
19	3743	160	Br	15−1, 17+1	11·
19	3743	90	Bh	17−4, 20+2, 22+5	12·
30	3754	,,	,,	15−4, 17−1	11·
Dec					
4	3758	,,	,,	=15, =16	11·
11	3765	80	Ry	10−5, 12−2, 15+3·5, 17+5	10·
16	3770	50	,,	12−2, 16+3	11·
18	3772	90	Bh	10−6, 15+3	11·
22	3776	,,	,,	10−3, 15+7	10·
24	3778	,,	,,	9−4, 10−1	10·
24	3778	80	Ry	9−1, =10, 12+3	10·
24	3778	50	Bn	12 (1) v (1) 13	10·
28	3782	90	Bh	9−2, 10+2	10·
1924 Jan					
2	3787	50	Ry	7−3, 9+3	9·
3	3788	45	Bh	7−5, 9+3	9·
5	3790	30	Ry	7−2, 9+6	9·
6	3791	50	Bn	7+1	9·
6	3791	22	Bl	5 (5) v (3) 7	8·
11	3796	45	Bh	5−6, 7+1	9·
14	3799	50	Bn	3 (2) v (1) 5	8·
15	3800	30	D	3 (4) v (1) 5, 5+3	8·
15	3800	22	Bl	3 (1) v (5) 5, 4 (1) v (5) 5	7·
16	3801	45	Bh	5+3	8·
17	3802	20	Ry	3−5, 4−4, H+1, K+6	8·
20	3805	,,	,,	=3, 4+1·5	7·
23	3808	45	Bh	3−4, 5+5	7·
25	3810	90	,,	3−1	7·
27	3812	45	,,	=3, =4	7·

June 18, Bl, With 22, 10·0.
July 6, Ga, t.
July 8, Wb, Very difficult.
July 16, t.
Aug. 15, Ma, Very difficult.

Sept. 29, Br, About.
Oct. 19, Not seen.
Oct. 31, Nov. 5, Br, Difficult.
Dec. 16, Jan. 5, 17, 20, t.
Jan. 2, T.

(5677) R SERPENTIS—*continued.*

1924					
Jan					
27	3812	10	Ry	=2, 3+2	7·0
31	3816	90	Bh	3+2	7·2
Feb					
1	3817	30	D	3+3	7·1
1	3817	50	Bn	3+2, 4+3	7·2
1	3817	37	Lp	v (1) 3 (2) 5, 2 (2) v (2) 3	7·0*b*
1	3817	22	Bl	C (1) v (4) 2	6·3
4	3820	16	Bn	2 (1) v (1) 3	7·1
8	3824	30	D	C (3) v (2) 3, 3+5	6·9
11	3827	90	Bh	3+3	7·1
14	3830	,,	,,	3+5	6·9
14	3830	22	Bl	C (1·5) v (3·5) 2	6·3
14	3830	30	D	C (3) v (1) 3, 3+4	7·1
14	3830	16	Bn	C (2) v (1) 2	6·6
16	3832	25	,,	C−4, 2+2·5	6·5
22	3838	90	Bh	3+6, 4+6	6·9
26	3842	45	,,	3+5, 4+5	7·0
28	3844	,,	,,	3+6, 4+6	6·9
28	3844	22	Bl	=C	6·1
Mar					
2	3847	45	Bh	3+6, 4+6	6·9
4	3849	30	D	C (2) v (1) 3, 3+5	7·0
4	3849	100	Lp	=2	6·8
4	3849	16	Bn	C (1) v (2) 2	6·4
6	3851	22	Bl	=C	6·1
7	3852	45	Bh	3+5, 4+5	7·0
8	3853	F	Bg	2 (1) v (2) 3	7·0*b*
8	3853	16	Bn	C (3) v (1) 2	6·6
8	3853	30	D	C (3) v (2) 3, 3+5	6·9
9	3854	t	Wb	C (2) v (3) 2	6·4
9	3854	45	Bh	3+4, 4+4	7·1
10	3855	F	Lp	=2	6·8*b*
10	3855	30	Bn	C (2) v (1) 2	6·6
11	3856	,,	D	C (3) v (1) 3, 3+3	7·1
11	3856	90	Bh	3+4	7·0
11	3856	15	Wb	C (2) v (3) 2, C (2) v (3) 4	6·5
12	3857	,,	,,	C (2) v (3) 3	6·7
12	3857	30	Bn	C (4) v (1) 2	6·7
14	3859	90	Bh	3+3	7·1
26	3871	,,	,,	3+1	7·3
28	3873	20	Wb	2 (2) v (3) 3	7·0*b*
29	3874	22	Bl	3+0·5	7·4*b*
29	3874	50	Bn	3+1	7·3
29	3874	45	Bh	=3, =4	7·5
30	3875	30	Bg	3 (1) v (5) 5	7·6
30	3875	,,	D	=3	7·4
31	3876	37	Lp	4 (2) v (2) 5	7·9
Apr					
1	3877	50	Bn	3+0·5	7·4
2	3878	90	Bh	=3, =4	7·5
4	3880	30	D	4−1	7·6
4	3880	50	Bn	=4	7·5
6	3882	90	Bh	3−1	7·5
7	3883	50	Bn	3−1, =4	7·5
7	3883	55	Bg	3 (3) v (1) 5	8·2
7	3883	37	Lp	4 (3) v (2) 5	8·0*b*
7	3883	22	Bl	3 (2) v (7) 5, 4 (2) v (7) 5	7·7
7	3883	20	Wb	=3	7·4

Feb. 1, D, With B, 7·2.
Feb. 8, Mar. 4, 8, 11, 30, D, 4^c.
Feb. 14, D, 3^c.
Mar. 28, t used by Wb until July 6.

1924					
Apr					
11	3887	20	Ry	3−5, H+3·5	7·9
11	3887	30	D	3 (2) v (3) 5, 3−5	7·9
11	3887	90	Bh	3−2, 4+2	7·7
14	3890	,,	,,	3−2	7·6
15	3891	37	Lp	5+2	8·2*b*
17	3893	30	Ry	4−5, H+1, K+4	8·1
17	3893	22	Bl	3 (2) v (7) 5, 4 (2) v (7) 5	7·7
20	3896	55	Bg	3 (5) v (1) 5	8·2
20	3896	45	Bh	3−2, 4−2	7·7
25	3901	,,	,,	3 (3) v (2) 5	8·0
25	3901	55	Bg	3 (8) v (1) 5	8·3*b*
25	3901	30	D	3 (6) v (1) 5, 5+2	8·2*b*
27	3903	90	Wh	3 (1) v (1) 7	8·3
27	3903	20	Wb	=5	8·4*b*
30	3906	90	Bh	3 (2) v (1) 5	8·1*b*
May					
4	3910	30	D	5+1	8·3
5	3911	55	Bg	5 (1) v (2) 6	8·6
5	3911	50	Bn	5+1·5	8·3
5	3911	,,	Ma	3−5, 5+2	8·1
5	3911	90	Bh	5−1	8·5
6	3912	30	Ry	5−2, (6+8)−2, K−2, 9+3·5	8·7
7	3913	22	Bl	5+0·5	8·4*b*
7	3913	30	D	=5	8·4
9	3915	,,	,,	5−1·5	8·6
10	3916	90	Bh	5 (1) v (2) 7	8·7
13	3919	22	Bl	5 (1) v (6) 7	8·5
13	3919	60	D	5 (3) v (2) 7, 7+5	8·9
13	3919	37	Lp	5 (2) v (1) 7	9·0*b*
13	3919	90	Bh	5 (1) v (3) 7	8·6
16	3922	,,	,,	5 (1) v (2) 7	8·7
19	3925	55	Bg	6 (4) v (1) 7	9·2
20	3926	37	Lp	=7	9·3*b*
21	3927	60	D	5 (4) v (1) 7, 7+3	9·0
21	3927	30	Ry	5−5, 7+1, 9+6	9·2
22	3928	45	Bh	5 (2) v (1) 7	9·0
22	3928	20	Wb	5 (3) v (2) 7	8·9
23	3929	30	D	5 (3) v (1) 7, 7+3	9·0
24	3930	22	Bl	5 (5) v (2) 7	9·0
25	3931	50	Ma	7+2	9·1
26	3932	90	Bh	7+1	9·2
26	3932	30	D	7+2	9·1
27	3933	90	Wh	3 (1) v (1) 10	8·8
27	3933	100	Lp	7 (1) v (4) 10	9·5
27	3933	50	Bn	5 (3) v (1) 7	9·0
27	3933	20	Wb	5 (4) v (1) 7	9·1
28	3934	,,	,,	=7	9·3
28	3934	55	Bg	=7	9·3*b*
28	3934	90	Bh	7+1	9·2
29	3935	30	Ry	7−1	9·4*b*
30	3936	60	D	7+1	9·2
June					
1	3938	,,	,,	=7	9·3
2	3939	50	Ma	5 (7) v (1) 7, 7+1	9·1
3	3940	22	Bl	5 (7) v (1) 7	9·1
5	3942	20	Wb	=7	9·3
5	3942	30	D	7+1	9·2
5	3942	55	Bg	7 (1) v (3) 9	9·4
6	3943	30	Ry	7−3·5, 9+2	9·7

April 11, 17, May 6, 21, Ry, t.
May 29, t.
June 2, Inclining to red.
June 5, Wb, Very red.
June 6 to July 25, Ry, T.

(5677) R SERPENTIS—*continued.*

1924					
June					
9	3946	60	D	7 (1) v (4) 10, 7−3	9·5
11	3948	90	Bh	7−2	9·5
12	3949	50	Ry	7−4, 9+2	9·7
14	3951	90	Bh	7 (1) v (2) 10, 9+5	9·6
16	3953	94	Bl	7 (4) v (4) 9	9·6
18	3955	90	Bh	7 (1) v (1) 10, 9+2	9·8
20	3957	50	Bn	7 (5) v (1) 9	9·9
20	3957	30	Ry	=9, 11+2	10·3
21	3958	60	D	7 (3) v (1) 10, 10+3	10·0
23	3960	55	Bg	7 (4) v (1) 9	9·9*b*
23	3960	100	Lp	10−1	10·4*b*
23	3960	20	Wb	=10	10·3
25	3962	40	,,	=10	10·3
26	3963	50	Ry	9−2·5, 11+1	10·5
26	3963	60	D	10−4, 13+3	10·6
29	3966	,,	,,	10−4, 13+3	10·6
29	3966	94	Bl	=9	10·0
30	3967	40	Wb	=10	10·3
30	3967	90	Bh	9−3, 10+1	10·3
July					
4	3971	40	Wb	=13	10·9
6	3973	,,	,,	10 (3) v (2) 13	10·7
6	3973	94	Bl	10 (1) v (3) 12	10·4
6	3973	60	D	12−3, 15+2	11·1
7	3974	M	Ph	12 (1) v (1) 16, 16+2	11·0
9	3976	90	Bh	10−1	10·4*b*
9	3976	60	D	13−4, =15	11·3*b*
10	3977	55	Bg	10 (1) v (2) 13	10·5*b*
11	3978	50	Bn	12 (4) v (1) 13	10·9
12	3979	94	Bl	12 (4) v (3) 15	11·1
14	3981	M	Ph	12−2, =13, 15+2	11·0
14	3981	90	Bh	10−2	10·5
19	3986	,,	,,	9−7, 10−5	10·8
19	3986	50	Ry	15−0·5, =17	11·5*b*
19	3986	90	Wh	=17	11·6
19	3986	120	Bn	15 (1) v (1) 17	11·5
19	3986	79	Ma	=15	11·3
21	3988	M	Ph	=15	11·3*c*
21	3988	20	Wb	=15	11·3
24	3991	40	,,	=15	11·3
24	3991	M	Ph	13 (1) v (1) 19, =15	11·4
24	3991	90	Bh	9 (3) v (1) 15	11·0
24	3991	100	Lp	=15	11·3
24	3991	120	Bn	17 (1) v (1) 18	11·8
25	3992	50	Ry	15−2, 17−1, 18+3	11·6
26	3993	94	Bl	=18	12·0
29	3996	90	Bh	=15, 17+3	11·3
29	3996	79	Ma	17−2, 18+1	11·8
29	3996	120	Bn	17 (2) v (1) 18	11·8
Aug					
1	3999	90	Bh	15 (1) v (1) 17	11·5*b*
5	4003	50	Wb	=19	12·1
5	4003	120	Bn	18 (3) v (2) 20	12·1

July 9, D, Difficult.
July 21, Wb, T used on and after this date.
July 24, Ph, Half-weight for first estimate.

1924					
Aug					
7	4005	79	Ma	21 (1) v (2) 22, 21−1, 22+2	12·4
7	4005	90	Wh	17−2	11·8
7	4005	,,	Bh	15−4, =16, =17	11·5
7	4005	M	Ph	17 (2) v (1) 23, =22	12·7
9	4007	94	Bl	=22	12·6
18	4016	79	Ma	22−1	12·7
19	4017	90	Bh	17 (2) v (1) 20	12·0
19	4017	OG	Ph	=21, 22−2	12·6
19	4017	120	Bn	22 (2) v (1) 23	13·1
22	4020	160	Br	22−2·5, 23+5	12·8
24	4022	79	Ma	22−2	12·8*b*
31	4029	75	Bg	<20	<12·2
Sept					
2	4031	90	Bh	=20	12·2
8	4037	,,	,,	20 (1) v (2) 23	12·6*b*
12	4041	,,	,,	<22	<12·6
16	4045	,,	,,	20 (1) v (1) 23	12·8
23	4052	,,	,,	<22	<12·6*b*
23	4052	120	Bn	=23	13·3*b*
26	4055	90	Bh	<22	<12·6
27	4056	120	Bn	23−1	13·4
27	4056	160	Br	22−5	13·1*b*
Oct					
1	4060	150	Bh	23+1	13·2
8	4067	120	Bn	<22	<12·6
17	4076	120	Br	Estimated	13·0*b*
24	4083	,,	,,	22−1	12·7
Nov					
3	4093	,,	,,	22−1	12·7*b*
5	4095	90	Bh	=20, =22	12·4*b*
7	4097	94	Bl	17 (4) v (1) 20, =20	12·1*b*
10	4100	90	Bh	17 (1) v (1) 20	11·9*b*
15	4105	94	Bl	15 (1) v (1) 17, =15	11·4
16	4106	90	Bh	=15, =16	11·3
Dec					
1	4121	,,	,,	10−1	10·4
4	4124	,,	,,	9 (2) v (1) 10	10·2
4	4124	50	Ry	12−2	10·9*b*
8	4128	60	D	<10	<10·3*b*
13	4133	90	Bh	9+2	9·8
19	4139	,,	,,	7 (1) v (3) 9	9·4
24	4144	,,	,,	7+1	9·2
24	4144	37	Wb	5 (3) v (2) 7	8·9
24	4144	50	Bn	7 (5) v (3) 9	9·7
28	4148	,,	,,	7+1	9·2
28	4148	30	Ry	7+1·5	9·1
28	4148	37	Wb	5 (1) v (4) 7	8·6
28	4148	90	Bh	5 (1) v (2) 7	8·7
30	4150	30	D	5−6, 7+3	9·0
31	4151	45	Bh	=5	8·4*b*

Sept. 12, Bh, Not seen.
Sept. 27, Br, Glimpsed.
Oct. 17, 24, About.
Nov. 3, About, Difficult.
Dec. 4, Ry, t.
Dec. 28, Ry, t.

(1717) V TAURI. (V. 5.)

H.D. 044617.

Date.	Julian Date.	Inst.	Observer.	Comparisons.	Deduced Mag.
1918					
May					
8	1722	90	Bh	4−7, =7	9·8*b*
Aug					
13	1819	,,	,,	=15, =17	10·7*b*
21	1827	45	,,	=15	10·5*b*
31	1837	90	,,	=15, 17+3	10·6
Sept					
7	1844	,,	,,	15+6	9·9
10	1847	45	,,	10−1	10·0
17	1854	90	,,	6−5, 10+1	9·9
25	1862	,,	,,	8−1, 10−1, 15+6	10·0
27	1864	,,	,,	=8, =10	9·9
30	1867	,,	,,	4−4, 6+2, 8+4	9·4
Oct					
2	1869	,,	,,	5+1, 6+5	9·0*b*
6	1873	45	,,	=5	9·2
8	1875	90	,,	=5	9·2
10	1877	,,	,,	=5	9·2
14	1881	,,	,,	5−1	9·3*b*
18	1885	,,	,,	5+1, 6+3	9·1
23	1890	,,	,,	=6	9·4
31	1898	,,	,,	6−3, 8+1	9·7
Nov					
2	1900	45	,,	8−2, 10−1, 15+5	10·0
5	1903	90	,,	8−2, 10−2	10·1
6	1904	160	Br	11−2	10·2
11	1909	45	Bh	15−1, 17+2	10·7
16	1914	90	,,	17−2, 21+4	11·1
22	1920	,,	,,	17−10, 21−5, 25+5	12·0
29	1927	,,	,,	25+3, 41+8	12·2*b*
Dec					
3	1931	,,	,,	17−12, 25+4	12·1
5	1933	150	,,	25−2, 41+3	12·7
13	1941	,,	,,	25−10, 41−5	13·5
20	1948	90	,,	<35	<12·7
24	1952	,,	,,	41−5	13·5
25	1953	120	Br	<25	<12·4
29	1957	150	Bh	38−8, 41−4	13·5*b*
31	1959	,,	,,	35−8, 41−5	13·5
1919					
Jan					
2	1961	90	,,	35−8, 41−5	13·5
6	1965	150	,,	25−10, 41−5	13·5
12	1971	90	,,	<25	<12·4
15	1974	,,	,,	<25	<12·4
18	1977	,,	,,	41−5	13·5
22	1981	,,	,,	35−4, 41−2	13·2
26	1985	,,	,,	25−1, 41+3	12·6*b*
28	1987	,,	,,	25−1, 35+1	12·6
Feb					
1	1991	,,	,,	=22, =25	12·4
7	1997	,,	,,	8−10, 11−10, 17−1	10·9
8	1998	,,	,,	8−8, 17+2	10·7
9	1999	150	,,	6−10, 8−6, 17+4	10·5
10	2000	90	,,	8−5, 17+5	10·4*b*

Dec. 20, 25, Jan. 12, Not seen.
Jan. 26, Unsteady.

Date.	Julian Date.	Inst.	Observer.	Comparisons.	Deduced Mag.
1919					
Feb					
12	2002	90	Bh	5−10, 8−3	10·2
18	2008	,,	,,	5−4, 6−2, 8+2	9·6
23	2013	,,	,,	5−1, 6+1	9·3*b*
23	2013	,,	Wh	4 (2) v (1) 8	9·6
27	2017	,,	Bh	=5, =6	9·3
28	2018	,,	,,	3−2, 5+1	9·1
Mar					
3	2021	,,	,,	3−2, 5+1	9·1
5	2023	62	Th	4+2	8·8
9	2027	45	Bh	1−12, 3+2	8·6
13	2031	90	,,	=3	8·9
16	2034	,,	,,	=3	8·9
18	2036	157	Th	4+2	8·8*b*
21	2039	90	Bh	=3, 5+3	8·9
23	2041	,,	,,	3+1	8·8
24	2042	62	Th	=4	9·0
28	2046	,,	,,	4+2	8·8
28	2046	45	Bh	3+1, 5+5, 8+10	8·8
31	2049	90	,,	3+1, 5+5	8·8
Apr					
4	2053	45	,,	=3, 5+5	8·8*b*
8	2057	90	,,	3−2, 5+3	9·0
9	2058	62	Th	=5	9·2
9	2058	90	Wh	4 (2) v (1) 8	9·6
12	2061	,,	Bh	3+1, 5+4, 8+10	8·8*b*
18	2067	,,	,,	3−1	9·0*b*
20	2069	45	,,	3−3, =5, =6	9·3
22	2071	90	,,	5−1, =6	9·4
26	2075	,,	,,	5−2, 6−1	9·5
May					
2	2081	,,	,,	5−2, 6−2	9·5*b*
July					
20	2160	,,	,,	<35	<12·7*b*
25	2165	,,	,,	<21	<11·5*b*
28	2168	,,	,,	<17	<10·9*b*
30	2170	,,	,,	<35	<12·7
Aug					
5	2176	,,	,,	22−4, 25−2	12·7*b*
14	2185	,,	,,	15−6, 17−3	11·2
16	2187	,,	,,	15−5, 17−5	11·2*b*
23	2194	45	,,	17−1	11·0
27	2198	90	,,	15−3, 17+1	10·8
30	2201	,,	,,	6−10, 8−6, 17+4	10·5
Sept					
1	2203	75	Bn	<11	<10·0
2	2204	90	Bh	17+4	10·5
6	2208	,,	,,	11−5, 15+2, 17+5	10·4
15	2217	,,	,,	10−3, 11−3	10·2
16	2218	,,	,,	6 (2) v (3) 17, 11−2	10·1
19	2221	75	Bn	15 (1) v (1) 17	10·7
23	2225	90	Bh	6 (1) v (2) 17, =11	9·9
27	2229	,,	,,	=11	10·0
27	2229	45	Br	11−4, 15+2	10·3
28	2230	50	Bn	8 (5) v (1) 15	10·4
28	2230	90	Wh	11 (1) v (1) 17	10·4

July 20, 30, Not seen. 35 glimpsed.

(1717) V TAURI—*continued.*

1919 Oct					
2	2234	50	Bn	=15	10·5
3	2235	90	Bh	6 (1) v (1) 17, 5−10, 11−3	10·2
7	2239	,,	,,	11−4, 15+2, 17+4	10·4
12	2244	45	,,	=15, 17+3	10·6
15	2247	90	,,	17+1	10·8
15	2247	160	Br	=17	10·9
16	2248	120	Bn	=17	10·9
18	2250	90	Bh	=17	10·9
21	2253	,,	,,	17−1	11·0
25	2257	,,	,,	17−5	11·4
25	2257	160	Br	22+2	12·1
26	2258	120	Bn	21 (2) v (1) 25	12·1
27	2259	90	Bh	17−5, 21+2	11·4
31	2263	120	Bn	25 (2) v (1) 30	12·5
Nov					
1	2264	150	Bh	=25, 35+5	12·3
2	2265	90	,,	=25, 35+3	12·4
10	2273	,,	,,	25−3	12·7*b*
13	2276	150	,,	35−6, 41−4	13·4
15	2278	90	,,	41−4	13·4
19	2282	120	Bn	<25	<12·4
21	2284	157	Th	41−10	14·0*c*
21	2284	150	Bn	<41	<13·0
21	2284	90	Bh	<41	<13·0
24	2287	,,	,,	<41	<13·0
27	2290	150	Bn	<41	<13·0
Dec					
2	2295	157	Th	41−5	13·5*b*
11	2304	90	Bh	25−10, 41−5	13·5
16	2309	,,	,,	41−5	13·5
21	2314	150	,,	25−8, 41−4	13·3
24	2317	,,	,,	35−5, 41−3	13·3
25	2318	90	,,	41−4	13·4
25	2318	120	Br	=41	13·0
1920 Jan					
1	2325	90	Bh	=35, 41+3	12·7*b*
5	2329	,,	,,	35−2	12·9
8	2332	,,	,,	=35	12·7
8	2332	157	Th	41−5	13·5
13	2337	90	Bh	25−2	12·6
14	2338	60	D	<17	<10·9
15	2339	90	Wh	25+3	12·1
15	2339	,,	Bh	25−1	12·5
16	2340	,,	,,	=22, =25	12·4*b*
21	2345	,,	,,	25+2	12·2
21	2345	50	Bn	21 (1) v (1) 25	12·0
23	2347	90	Bh	17−5, =21, 25+10	11·5
24	2348	,,	Wh	17 (1) v (1) 25	11·7
24	2348	120	Bn	21 (2) v (3) 25	11·9
25	2349	90	Bh	15−4, 17−1	11·0
31	2355	45	,,	11−5, 17+4	10·5*b*
Feb					
4	2359	90	,,	8−3, 11−1	10·1
4	2359	,,	Wh	8 (1) v (1) 10	9·9
6	2361	,,	Bh	8−2, =11	10·0
7	2362	,,	,,	8−1, 11+1	9·9
8	2363	120	Bn	6 (3) v (1) 8	9·8
11	2366	50	,,	6 (4) v (1) 8	9·8
1920 Feb					
11	2366	90	Bh	8+1, 11+2	9·8
13	2368	,,	,,	8−1, 11+1	9·9
17	2372	,,	,,	=8	9·9
17	2372	160	Br	4−2, 6+2	9·2
17	2372	50	Bn	6 (2) v (1) 8	9·7
17	2372	90	Wh	=8	9·9
23	2378	,,	Bh	8+1, 11+3	9·7
27	2382	,,	,,	8+1, 11+4	9·7*b*
Mar					
2	2386	,,	,,	=8, =11	9·9*b*
3	2387	50	Bn	6 (1) v (1) 8	9·6
7	2391	,,	,,	6 (3) v (1) 8	9·8
7	2391	90	Bh	=8, 11+2	9·8
8	2392	,,	Wh	6 (2) v (1) 8	9·7
11	2395	,,	Bh	8+1, 11+3	9·7
12	2396	120	Bn	6 (3) v (1) 8	9·8
15	2399	30	D	6−2, 8+3	9·6
17	2401	90	Bh	8+1, 11+3	9·7
18	2402	120	Bn	6−3, 8+1	9·7
19	2403	60	D	6−3, 8+2	9·7
20	2404	120	Bn	8+1	9·8
21	2405	90	Wh	10−2	10·1
22	2406	,,	Bh	8−2, =11	10·0
31	2415	,,	,,	=11	10·0
31	2415	120	Bn	8 (1) v (2) 15	10·1
Apr					
6	2421	60	D	17−1	11·0*b*
10	2425	90	Bh	8−5, 11−2	10·3
12	2427	,,	,,	8−5, 11−3	10·3*b*
16	2431	,,	,,	11−6	10·6*b*
16	2431	75	Bn	<18	<11·1
17	2432	90	Bh	11−6	10·6*b*
July					
10	2516	,,	,,	11+1	9·9*b*
15	2521	,,	,,	8+1, 11+3	9·7*b*
30	2536	,,	,,	=11	10·0
Aug					
13	2550	45	,,	=8, 11+1	9·9
18	2555	90	,,	8+3, 11+3	9·6
22	2559	75	Bn	8−1	10·0*b*
26	2563	,,	,,	6 (3) v (1) 8	9·8
26	2563	90	Bh	8+1, 11+2	9·8*b*
29	2566	,,	,,	11+1	9·9
Sept					
4	2572	45	,,	11−2	10·2
7	2575	75	Bn	8 (1) v (3) 15	10·0*b*
10	2578	90	Bh	11−1	10·1
12	2580	75	Bn	8 (1) v (1) 15	10·2*b*
16	2584	90	Bh	11+1	9·9
22	2590	,,	,,	11−3	10·3
25	2593	,,	,,	11−6, =15, 17+3	10·6
28	2596	,,	,,	15+1	10·4*b*
Oct					
1	2599	45	,,	11−5, 15+1	10·4
4	2602	60	D	<17	<10·9
6	2604	90	Bh	17−2	11·1
9	2607	,,	,,	15−3, =17	10·9*b*
12	2610	,,	,,	17−8, 21−3	11·8
13	2611	75	Bn	<17	<10·9
18	2616	90	Bh	22−5, 25−2	12·7

Nov. 21, Bn, Probably glimpsed. Bh, Not seen. 41 easy.
Nov. 24, 27, Not seen.
Dec. 2, If correctly identified.
Dec. 16, Difficult.
Dec. 25, Br, About.

Feb. 17, Bh, Not steady.
Feb. 23, Pale yellow.
April 6, Difficult.
April 16, Bn, Glimpsed.
Oct. 4, Suspected.
Oct. 13, Not seen.

(1717) V TAURI—*continued.*

1920 Nov					
4	2633	50	Bn	<21	<11·5
8	2637	150	Bh	41−3	13·3
10	2639	,,	,,	25−10, 41−5	13·5
15	2644	90	,,	38−8, 41−5	13·6
21	2650	150	Bn	<41	<13·0
Dec.					
3	2662	150	Bh	<41	<13·0
8	2667	90	Bh	25−2, 41+2	12·7
10	2669	,,	,,	25+1, 41+5	12·4
12	2671	,,	,,	25+2	12·2*b*
17	2676	,,	,,	15−5, 17−1	11·0
21	2680	,,	,,	17−1	11·0
26	2685	150	,,	8−4, 11−2	10·2
28	2687	90	,,	11−1	10·1
28	2687	75	Bn	8 (4) v (1) 15	10·4
31	2690	90	Bh	=8, 11+1	9·9
1921 Jan					
2	2692	,,	,,	=8, =11	9·9
6	2696	,,	,,	=8, =11	9·9*b*
12	2702	75	Bn	=8	9·9
13	2703	90	Bh	=8, 11+2	9·8
15	2705	,,	,,	8+5	9·4
15	2705	75	Bn	6 (1) v (1) 8	9·6
16	2706	30	D	4−4, 6+1	9·4*b*
21	2711	45	Bh	6+1, 8+4	9·4
22	2712	120	Bn	6+3	9·1
28	2718	50	,,	6+4	9·0*b*
30	2720	90	Bh	6+1, 8+5	9·3
31	2721	50	Bn	5+3	8·9
Feb					
2	2723	90	Bh	6+1, 8+5	9·3
9	2730	,,	,,	=5, 6+2	9·2
14	2735	50	Bn	5+2·5	9·0
16	2737	90	Bh	=5, =6	9·3*b*
20	2741	,,	,,	=5, =6	9·3
20	2741	50	Bn	5 (1) v (1) 6	9·3
24	2745	,,	,,	5+0·5	9·2
25	2746	90	Bh	5−2, =6, 11+4	9·5
26	2747	50	Bn	5 (4) v (1) 6	9·4
Mar					
1	2750	,,	,,	=6	9·4
2	2751	90	Bh	6−2, 8+2, 11+3	9·7
3	2752	50	Gr	10−0·5, =11	10·0
7	2756	,,	Bn	8 (1) v (3) 15	10·0
7	2756	90	Bh	=11	10·0
10	2759	,,	,,	11−2	10·2
15	2764	96	Gr	17+2	10·7
17	2766	45	Bh	11−8, =15	10·6
18	2767	120	Bn	=21	11·5
21	2770	45	Bh	11−10, =15	10·7*b*
24	2773	90	,,	15−1, 17+1	10·7
25	2774	120	Bn	21 (2) v (1) 25, 27+3	12·1
29	2778	90	Bh	15−3, =7	10·9*b*
30	2779	150	Bn	25 (2) v (1) 30	12·5
Apr					
2	2782	96	Gr	=38	12·9
6	2786	150	Bn	<25	<12·4
7	2787	90	Bh	15−7, 17−3	11·2
11	2791	96	Gr	...	...
Aug					
31	2933	90	Bh	17−3, 21+4	11·2

Nov. 4, 21, Dec. 3, Not seen.
April 6, t, Not seen.
April 11, Invisible.

1921 Sept					
5	2938	120	Bn	<25	<12·4
6	2939	60	D	<17	<10·9
6	2939	90	Bh	21−5, 25+4	12·0
16	2949	,,	,,	25−2	12·6
24	2957	,,	,,	<35	<12·7
27	2960	150	Bn	41−3	13·3*b*
28	2961	60	D	<17	<10·9
30	2963	90	Bh	Estimated	<12·9
Oct					
1	2964	150	Wf	41−5	13·5
6	2969	,,	,,	41−10	14·0
6	2969	,,	Bn	41−1	13·1
6	2969	,,	Bh	35−3	13·0
8	2971	,,	,,	35−3, 38−2	13·1
17	2980	90	,,	35−2	12·9
22	2985	157	Wf	<41	<13·0
23	2986	150	Bn	41−1	13·1*b*
23	2986	90	Bh	35−2, 38−1	13·0
27	2990	,,	,,	25−4	12·8
30	2993	96	Gr	41−5	13·5*b*
31	2994	90	Bh	25−2	12·6
Nov					
6	3000	150	Bn	41−2	13·2
7	3001	90	Bh	<25	<12·4
10	3004	150	Bn	41+1	12·9*b*
12	3006	,,	Bh	25−1, 35+2	12·5
23	3017	90	,,	25+1	12·3*b*
23	3017	120	Bn	25 (1) v (4) 41	12·5
26	3020	,,	,,	25−1	12·5
29	3023	90	Bh	=25	12·4
Dec					
3	3027	,,	,,	25+3	12·1
13	3037	,,	,,	17−8, 21−2	11·7
15	3039	,,	,,	17−6, =21	11·5
15	3039	62	Wf	17−4, 21+1	11·4
20	3044	90	Bh	11−3	10·3
20	3044	50	Bn	15 (2) v (1) 17	10·8
22	3046	,,	,,	15−1, 17+2	10·7
23	3047	90	Bh	11+1	9·9
25	3049	,,	,,	11+3	9·7
27	3051	96	Gr	=11	10·0
28	3052	75	Bn	6 (3) v (1) 8	9·8
29	3053	90	Bh	=11	10·0
30	3054	,,	,,	11+1	9·9
30	3054	62	Wf	6−3, 8+1	9·7
31	3055	75	Bn	6 (3) v (1) 8	9·8
1922 Jan					
1	3056	90	Bh	11+2	9·8
3	3058	75	Bn	6 (3) v (2) 8	9·7
4	3059	60	D	6−4, 8+1	9·8*b*
4	3059	90	Wh	=11	10·0
8	3063	,,	Bh	11+1	9·9
10	3065	,,	,,	=8, =11	9·9*b*
16	3071	75	Bn	6 (3) v (1) 8	9·8
17	3072	62	Wf	6−4, =8, 10+1·5	9·8
18	3073	90	Bh	=8, 11+2	9·8
20	3075	75	Bn	8−2	10·1*b*
23	3078	62	Wf	=8	9·9

Sept. 5, t, Not seen.
Sept. 24, Nov. 7, Not seen.
Sept. 30, Not seen. 25, 35 easy.
Oct. 1, A glimpse with 9-in.
Oct. 6, Wf, A glimpse only.
Oct. 22, Invisible. Very much <41.
Oct. 30, About.

(1717) V TAURI—*continued.*

1922					
Jan					
24	3079	90	Bh	11−2, 17+6	10·2
29	3084	,,	,,	11−4, 15+2	10·3
Feb					
1	3087	60	D	10−6, 17+3	10·6*b*
2	3088	90	Bh	11−6, =15	10·5
4	3090	70	Gr	=11	10·0
4	3090	62	Wf	8−5, 15+2	10·3
10	3096	90	Bh	=15, =17	10·7*b*
11	3097	120	Bn	=21	11·5*b*
13	3099	90	Wh	11 (2) v (1) 25	11·6
17	3103	50	Bn	21 (5) v (2) 25	12·2
17	3103	90	Bh	=17	10·9
19	3105	62	Wf	21−6, 25+4	12·1
20	3106	70	Gr	=25	12·4
24	3110	120	Bn	25+1	12·3*b*
26	3112	90	Bh	17−6	11·5
26	3112	,,	Wh	=27	12·5
28	3114	62	Wf	25 (1) v (1) 41	12·7
Mar					
4	3118	120	Bn	<25	<12·4
4	3118	90	Bh	25+2	12·2
7	3121	,,	Wh	=25	12·4
10	3124	,,	Bh	=25	12·4*b*
15	3129	62	Wf	41−1	13·1
16	3130	70	Gr	<41	<13·0*b*
16	3130	90	Wh	<25	<12·4
16	3130	,,	Bh	25−3	12·7
17	3131	,,	,,	25−5	12·9
19	3133	,,	,,	25−5, =35	12·8
20	3134	150	Bn	41−3	13·3*b*
22	3136	,,	Wf	41−2	13·2
26	3140	,,	,,	41−2	13·2
28	3142	,,	Bn	41−1·5	13·1
28	3142	90	Bh	25−6, 35−3	13·0
Apr					
15	3160	70	Gr	25−3, 41+2	12·8
20	3165	150	Wf	22 (2) v (4) 25	12·3
29	3174	90	Bh	<41	<13·0
June					
27	3233	,,	,,	<21	<11·5
Aug					
5	3272	,,	,,	<21	<11·5
12	3279	,,	,,	<25	<12·4
21	3288	150	Wf	<27	<12·5*b*
23	3290	120	Bn	<25	<12·4
25	3292	90	Bh	<25	<12·4
27	3294	150	Wf	35−2, =41	13·0
31	3298	90	Bh	<25	<12·4
Sept					
9	3307	,,	,,	25−8, 35−4	13·2
13	3311	157	Wf	<41	<13·0*c*
15	3313	90	Bh	41−2	13·2
16	3314	157	Wf	41−5	13·5*b*
20	3318	150	,,	41−5	13·5
21	3319	,,	Bh	25−6, 35−3	13·0
23	3321	157	Wf	41−5	13·5*b*
26	3324	90	Bh	25−6, =41	13·0

Feb. 1, Difficult.
Mar. 4, Bn, Glimpsed.
Mar. 16, Wh, Invisible.
April 29, Aug. 31, Not seen.
June 27, Aug. 5, Not certainly seen.
Aug. 12, 25, Sept. 16, Glimpsed.
Aug. 23, t, Not seen.
Sept. 13, Invisible.

1922					
Oct					
11	3339	90	Bh	25−4, 41+1	12·9*b*
13	3341	,,	,,	25−3	12·7
13	3341	157	Wf	=39	13·4
15	3343	120	Bn	<25	<12·4
15	3343	44	Li	<25	<12·4
17	3345	157	Wf	25 (1) v (1) 35	12·6
18	3346	100	Lp	<25	<12·4*b*
18	3346	90	Bh	25−2	12·6
21	3349	,,	,,	25−1	12·5
23	3351	120	Bn	25 (3) v (2) 30	12·5
25	3353	90	Bh	25+1	12·3
27	3355	,,	,,	25+2	12·2
27	3355	94	Li	=25	12·4*b*
28	3356	100	Lp	25−1	12·5
28	3356	94	Li	=22	12·3
28	3356	120	Bn	25+1	12·3
30	3358	90	Bh	17−10, 25+5	11·9
Nov					
1	3360	100	Lp	21 (2) v (1) 22	12·0*b*
4	3363	90	Bh	=21	11·5*b*
9	3368	,,	,,	17−6	11·5*b*
11	3370	,,	,,	17−7, 25+9	11·6
11	3370	100	Lp	17−1	11·0*b*
13	3372	120	Bn	17 (1) v (1) 18	11·0
14	3373	90	Bh	17−3, 21+6	11·1
15	3374	120	Bn	15 (2) v (1) 17	10·8
15	3374	100	Lp	11 (2) v (1) 17	10·6*b*
17	3376	90	Bh	17+2	10·7
17	3376	32	Ca	15 (1) v (2) 17	10·6
18	3377	37	Lp	11 (1) v (2) 17, =15	10·4
18	3377	50	Bn	8 (4) v (1) 15	10·4
19	3378	90	Bh	11−2, 17+7	10·2
21	3380	,,	,,	=11	10·0
24	3383	,,	,,	11+1	9·9
24	3383	100	Lp	=10	9·9
24	3383	50	Bn	8 (1) v (2) 15	10·1
27	3386	32	Ca	=10, =11	9·9
28	3387	90	Bh	11+2	9·8*b*
Dec					
1	3390	,,	,,	11+2	9·8
6	3395	,,	,,	11+2	9·8
6	3395	100	Lp	=6	9·4*b*
7	3396	32	Ca	=10, 11+1	9·9
8	3397	50	Bn	8 (2) v (1) 15	10·3
9	3398	90	Bh	11+2	9·8
11	3400	,,	,,	11+2	9·8
14	3403	32	Ca	=8	9·9
16	3405	100	Lp	6 (2) v (1) 8	9·6*b*
16	3405	90	Bh	11+1	9·9
17	3406	,,	,,	10+1, 11+1	9·8
18	3407	50	Bn	8 (1) v (4) 15	10·0*b*
20	3409	100	Lp	10 (2) v (2) 11	9·9
23	3412	,,	,,	=11	10·0
24	3413	75	Bn	8 (1) v (4) 15	10·0
25	3414	90	Bh	=11	10·0
26	3415	100	Lp	=11	10·0
30	3419	32	Ca	=8	9·9
1923					
Jan					
4	3424	90	Bh	11−2	10·2
6	3426	,,	,,	11−5	10·5
6	3426	100	Lp	11 (4) v (1) 15	10·4

Oct. 15, Bn, Not seen.
Oct. 18, Lp, Not seen.
Oct. 28, Lp, Difficult.

(1717) V TAURI—*continued.*

1923					
Jan					
6	3426	94	Li	11 (4) v (6) 15	10·2*b*
8	3428	75	Bn	15 (2) v (1) 17	10·8
9	3429	100	Lp	17+2	10·7*c*
11	3431	90	Bh	11−5, 17+3	10·5
12	3432	100	Lp	17 (2) v (2) 21	11·2*b*
13	3433	62	Wf	21+1	11·4*b*
14	3434	75	Bn	18 (2) v (1) 21	11·4
14	3434	100	Lp	17−1	11·0
14	3434	94	Li	17 (4) v (6) 21	11·1
14	3434	90	Bh	6−12, 17+2	10·7
16	3436	100	Lp	=21	11·5
18	3438	32	Ca	21 (1) v (7) 22	11·6
20	3440	90	Bh	17−3, 21+4	11·2
20	3440	94	Li	21 (5) v (5) 23	11·9
20	3440	100	Lp	21 (2) v (2) 22	11·9
23	3443	,,	,,	22 (2) v (2) 25	12·4*b*
23	3443	62	Wf	25+2	12·2
24	3444	120	Bn	25+2	12·2
27	3447	90	Bh	25+1	12·3
Feb					
4	3455	100	Lp	<30	<12·5*b*
5	3456	120	Bn	41−1	13·1*b*
7	3458	157	Wf	41−1	13·1
8	3459	90	Bh	25−4	12·8
16	3467	,,	,,	25−6, =41	13·0
27	3478	150	,,	Estimated	<13·1
Mar					
18	3497	94	Li	<41	<13·0
Apr					
6	3516	62	Wf	21−2, 27+5	11·8*b*
8	3518	94	Li	21 (5) v (5) 22	11·9
8	3518	90	Bh	17−10	11·9*b*
13	3523	,,	,,	17−8, 21−1	11·7
14	3524	,,	,,	21+1	11·4
15	3525	62	Wf	21−2, 22+5	11·8
20	3530	90	Bh	11−8	10·8
22	3532	62	Wf	17−2, 21+4	11·1*b*
27	3537	90	Bh	11+1	9·9
May					
3	3543	45	,,	=11	10·0*b*
July					
20	3621	,,	,,	<11	<10·0
30	3631	,,	,,	<17	<10·9
Aug					
4	3636	90	,,	<41	<13·0
9	3641	,,	,,	25−6, 41−1	13·1
12	3644	157	Wf	<41	<13·0*b*
15	3647	...	Sa	<35	<12·7
15	3647	90	Bh	25−5	12·9*b*
17	3649	150	Wf	41−3	13·3
22	3654	,,	Bh	41−1	13·1
28	3660	...	Sa	<25	<12·4
30	3662	90	Bh	25−1, 41+3	12·6
Sept					
2	3665	,,	,,	25−3	12·7*b*
5	3668	150	Wf	25−2, 35+3·5	12·5
7	3670	90	Bh	25−1	12·5
8	3671	,,	,,	25+1	12·3
8	3671	OG	Ph	=25	12·4
10	3673	90	Bh	17−8, 25+5	11·8
11	3674	50	Bn	21 (7) v (2) 25	12·2
12	3675	150	Wf	22+4, 25+5	11·9

Feb. 27, July 20, 30, Aug. 4, Not seen.
Mar. 18, Very difficult.
April 8, Li, Difficult. Bh, Glimpsed.
Aug. 15, 28, Sa, Not visible.

1923					
Sept					
12	3675	OG	Ph	25+3	12·1*b*
13	3676	90	Bh	17−3	11·2
15	3678	,,	,,	=17	10·9
15	3678	...	Sa	17−5, 21+1, 25+8	11·5
15	3678	90	Wh	25+5	11·9
18	3681	100	Lp	17 (2) v (2) 21	11·2*b*
22	3685	90	Bh	11−4, 17+6	10·3
23	3686	50	Bn	18 (1) v (1) 21	11·3
26	3689	90	Bh	11−5, 15+5	10·2
29	3692	...	Sa	11−1	10·1
30	3693	90	Bh	11−2, 15+7	10·0*b*
Oct					
1	3694	,,	,,	11−1	10·1
1	3694	62	Wf	10−3, 17+6	10·3*b*
4	3697	120	Bn	8+1, 11+2	9·8
4	3697	100	Lp	=10	9·9*b*
4	3697	90	Bh	11+1	9·9
7	3700	,,	,,	11+2	9·8
9	3702	,,	,,	11+2	9·8
9	3702	150	Wf	=8	9·9
11	3704	...	Sa	4−6, 5−2, 6+1, 8+5	9·4
11	3704	90	Bh	5−4, 11+3	9·6
13	3706	37	Lp	4 (2) v (2) 5	9·1*b*
14	3707	50	Bn	5 (1) v (1) 6	9·3
17	3710	60	D	5−2, 9+5	9·5
17	3710	32	Ca	5 (1) v (1) 6	9·3
17	3710	90	Wh	=8	9·9
17	3710	,,	Bh	3−5, 11+5	9·5
20	3713	,,	,,	3−1, 5+2	9·0
22	3715	100	Lp	4 (1) v (4) 5	9·0*b*
25	3718	45	Bh	11+5	9·5*b*
30	3723	62	Wf	4+3, 5+5	8·7
Nov					
1	3725	32	Ca	=3	8·9
1	3725	90	Bh	=3, 5+5	8·8
3	3727	,,	,,	=3	8·9
3	3727	100	Lp	4+1	8·9
6	3730	50	Bn	5+2	9·0
6	3730	...	Sa	3+1, 4+2, 5+5	8·8
7	3731	60	D	4−0·5	9·1
7	3731	90	Bh	3+1, 5+4	8·8
8	3732	100	Lp	v (2) 4 (2) 5	8·8
9	3733	45	Bh	3+1	8·8
10	3734	50	Bn	5+1	9·1
11	3735	90	Bh	3+1	8·8
14	3738	100	Lp	4+2	8·8*c*
17	3741	45	Bh	3−2, 5+2	9·1*b*
18	3742	50	Bn	5+1	9·1
18	3742	100	Lp	5 (2) v (2) 6	9·3*b*
23	3747	90	Bh	11+8	9·2
24	3748	...	Sa	=4	9·0
26	3750	32	Ca	5 (1) v (1) 6	9·3
30	3754	60	D	6−3, 10+2	9·7
30	3754	50	Bn	6 (1) v (3) 8	9·5
30	3754	45	Bh	11+4	9·6*b*
Dec					
2	3756	90	,,	11+2	9·8
2	3756	32	Ca	8−1	10·0
4	3758	100	Lp	6 (2) v (1) 8	9·7*b*
5	3759	90	Bh	11+1	9·9
6	3760	...	Sa	4−5, 6−1, 11+2	9·6
8	3762	90	Bh	=11	10·0
9	3763	100	Lp	=10	9·9
9	3763	30	D	=11	10·0

Sept. 18, Reddish.

(1717) V TAURI—*continued.*

1923 Dec					
11	3765	32	Ca	11 (1) v (5) 15	10·1
12	3766	62	Wf	10−2, 17+6	10·2
12	3766	90	Bh	11−2	10·2*b*
15	3769	100	Lp	8 (2) v (1) 17	10·5*b*
16	3770	50	Bn	=17	10·9*b*
18	3772	...	Sa	11−4, 15−3, 17+3	10·6
18	3772	90	Bh	=15, 17+3	10·6
24	3778	,,	,,	17−2, 21+4	11·1
28	3782	...	Sa	=25	12·4
30	3784	60	D	21−2	11·7
31	3785	32	Ca	21 (5) v (2) 22	12·1
1924 Jan					
2	3787	100	Lp	=25	12·4*b*
3	3788	134	Sa	25−2, 41+3	12·7
3	3788	90	Bh	21−5	12·0
5	3790	,,	,,	41+3	12·7
5	3790	60	D	17 (2) v (1) 25	11·9*b*
6	3791	120	Bn	30 (1) v (1) 41	12·7
6	3791	150	Lp	<35	<12·7*b*
6	3791	90	Wh	25 (1) v (1) 29	12·6
11	3796	,,	Bh	=41	13·0
25	3810	150	,,	<41	<13·0
27	3812	,,	Bn	<41	<13·0
Feb					
1	3817	,,	Wf	41−4·5	13·4*b*
2	3818	157	,,	41−8	13·8
8	3824	,,	,,	41−8	13·8
18	3834	90	Bh	41−6	13·6
21	3837	,,	,,	41−4	13·4*b*
26	3842	,,	,,	41−3	13·3
28	3844	,,	,,	41−3	13·3*b*
Mar					
1	3846	,,	,,	41−2	13·2
1	3846	134	Sa	<25	<12·4
2	3847	90	Bh	=41	13·0
4	3849	,,	,,	25−3, 41+2	12·8
4	3849	120	Bn	25+1, 27+1	12·4
7	3852	,,	,,	25+2, 27+2	12·3
7	3852	90	Bh	25−1	12·5
9	3854	,,	,,	25+1	12·3
10	3855	,,	,,	25+2	12·2*b*
10	3855	134	Sa	17−6, 22+8	11·5
11	3856	90	Bh	25+4	12·0
13	3858	64	Sa	17−4, 21+3	11·3
19	3864	50	Bn	17 (1) v (2) 18	11·0
20	3865	64	Sa	17−5, 21+3	11·3
22	3867	90	Bh	11−4	10·4
23	3868	32	Ca	11 (5) v (1) 15	10·4
26	3871	90	Bh	11−1	10·1
29	3874	,,	,,	11−1	10·1
29	3874	50	Bn	=15	10·5
29	3874	100	Lp	15 (2) v (2) 17	10·7*b*
Apr					
1	3877	50	Bn	11 (4) v (1) 15	10·4
4	3880	,,	,,	11 (3) v (2) 15	10·3
4	3880	32	Ca	11 (1) v (5) 15	10·1
4	3880	90	Bh	11−2	10·2
7	3883	50	Bn	8−1·5, =11	10·0
7	3883	64	Sa	=8, =11	9·9*b*
7	3883	62	Wf	10−3, 17+5	10·3
1924 Apr					
8	3884	90	Bh	11−2	10·2
11	3887	,,	,,	11−2	10·2
14	3890	50	Bn	8−1·5, 11 (1) v (3) 15	10·1
16	3892	90	Bh	11−1	10·1
19	3895	,,	,,	=11	10·0
20	3896	50	Bn	8 (1) v (3) 13	10·0
24	3900	32	Ca	8 (1) v (1) 11, =10	9·9
24	3900	150	Wf	=8	9·9
25	3901	90	Bh	11+2	9·8
29	3905	150	Wf	6−2, 8+3	9·6
30	3906	90	Bh	11+3	9·7
May					
3	3909	45	,,	11+3	9·7
July					
26	3993	90	,,	<21	<11·5
30	3997	,,	,,	<21	<11·5
Aug					
3	4001	,,	,,	<25	<12·4
8	4006	,,	,,	=25	12·4
9	4007	157	Wf	41−2	13·2
19	4017	90	Bh	17 (3) v (1) 25	12·1
25	4023	,,	,,	17 (3) v (2) 25	11·8
25	4023	62	Wf	21−5, 22+3	12·0
Sept					
2	4031	,,	,,	=21	11·5
2	4031	90	Bh	11−5, 17+4	10·5
5	4034	,,	,,	11−2	10·2
16	4045	,,	,,	=11	10·0
17	4046	,,	Sa	8+1, =10	9·8
24	4053	45	Bh	11+3	9·7
27	4056	64	Sa	4−5, 5−2, 11+5	9·5
27	4056	62	Wf	=4, 5+2	9·0
29	4058	90	Bh	4 (1) v (2) 11	9·3
Oct					
1	4060	45	,,	4 (1) v (2) 11	9·3
3	4062	90	,,	4 (1) v (3 11	9·2
5	4064	62	Wf	4−0·5, 5+2	9·0
6	4065	90	Wh	4 (1) v (1) 6	9·2
6	4065	,,	Sa	=8	9·9
8	4067	,,	Bh	11+5	9·5
13	4072	45	,,	11+3	9·7
15	4074	90	,,	11+2	9·8
19	4078	32	Ca	6 (1) v (4) 8	9·5
21	4080	90	Sa	8−1, =10, 11+3	9·9
23	4082	50	Bn	6 (2) v (1) 11	9·8
23	4082	100	Lp	4 (2) v (2) 8	9·4
23	4082	90	Bh	11+1	9·9
26	4085	34	Li	4 (8) v (2) 5	9·2
27	4086	90	Bh	11+2	9·8
27	4086	,,	Wh	=11	10·0
28	4087	100	Lp	4 (2) v (1) 6	9·3
31	4090	90	Bh	11+1	9·9
Nov					
1	4091	32	Ca	=8	9·9
3	4093	90	Bh	11+1	9·9
3	4093	,,	Sa	=6, =8	9·6
3	4093	50	Bn	6 (3) v (1) 8	9·8
3	4093	34	Li	=8	9·9
4	4094	,,	,,	6 (4) v (6) 8	9·6
4	4094	75	Lp	6 (4) v (1) 8	9·8
8	4098	45	Bh	11−1	10·1
15	4105	90	,,	11−2	10·2
24	4114	45	,,	11 (2) v (1) 17	10·6
27	4117	90	,,	11 (3) v (1) 17	10·7
27	4117	120	Bn	18 (3) v (1) 21	11·4

Jan. 5, D, Difficult.
Jan. 6, Lp, Not seen.
Jan. 25, 27, Not seen.
Feb. 1, Very difficult.
Feb. 8, Difficult.

July 26, 30, Aug. 3, Not seen.

(1717) V TAURI—*continued.*

Date.	Julian Date.	Inst.	Observer.	Comparisons.	Deduced Mag.
1924 Nov 29	4119	90	Bh	17+1	10·8
30	4120	32	Ca	17 (5) v (1) 21	11·4
30	4120	60	D	17 (4) v (3) 22	11·7
30	4120	44	Li	17 (3) v (7) 21	11·1
Dec 2	4122	T	Bk	17−2	11·1
3	4123	94	Li	21 (3) v (7) 25	11·8
5	4125	90	Bh	=17	10·9
12	4132	,,	,,	17 (1) v (1) 25	11·7*b*
13	4133	134	Sa	=30	12·5
13	4133	94	Li	21 (7) v (3) 25	12·2*b*
14	4134	T	Bk	21−1	11·6
14	4134	90	Bh	17 (2) v (1) 25	11·9
1924 Dec 14	4134	90	Wh	=25	12·4
14	4134	121	Ha	25 (1) v (2) 41	12·6
15	4135	193	Li	21 (8) v (2) 25	12·3
17	4137	T	Bk	=25	12·4
19	4139	90	Bh	25+2	12·2
20	4140	T	Bk	22−1, 25+1	12·4
22	4142	,,	,,	22−1, 25+1	12·4
25	4145	60	D	<25	<12·4
25	4145	90	Bh	25−1	12·5*b*
26	4146	121	Ha	25 (2) v (3) 35	12·6
27	4147	90	Sa	25−2, 41+3	12·7
30	4150	M	Ph	=41	13·0
30	4150	90	Bh	25−3	12·7

(3825) R URSÆ MAJORIS. (V. 1.)

H.D. 103769.

Star E = B.D. + 68° 605, $7^{m}\cdot67$, **H.A., 54,** 118.
,, F = ,, + 67° 658, 7·27, ,, **54,** 119.
,, M = ,, + 70° 641, 7·37, ,, **54,** 124.

Date.	Julian Date.	Inst.	Observer.	Comparisons.	Deduced Mag.
1920 Jan 1	2325	90	Bh	=5	8·2*b*
2	2326	80	AB	5−5, m+7·5	8·7
5	2329	90	Bh	5+2	8·0
5	2329	30	Bn	3−2, 4+1, 5+3	7·9
8	2332	,,	,,	3+1	7·6
8	2332	23	Bo	3 (1) v (3) 4	7·8
8	2332	90	Bh	5+3	7·9*b*
9	2333	22	Ni	3+1, 5+2·5	7·8
13	2337	90	Bh	5+2	8·0*b*
14	2338	23	Bo	3 (1) v (3) 4	7·8
14	2338	30	D	e−2, 3+3	7·3
16	2340	,,	Bn	3+2	7·5
16	2340	F	AB	3+2	7·5
17	2341	,,	,,	=E, 3+1·5	7·6
18	2342	,,	,,	=3	7·7
19	2343	23	Bo	2 (19) v (1) 3	7·6
19	2343	30	Bn	3+3	7·4
21	2345	45	Bh	=3, =4, 5+5	7·8
21	2345	79	Ma	5+4	7·8
22	2346	F	AB	e−2·5, 3+3	7·4
23	2347	23	Bo	2 (3) v (2) 3	7·0
23	2347	30	D	e+3	6·8
23	2347	22	Ni	3+4	7·3
24	2348	45	Bh	=3, =4	7·8
24	2348	30	Bn	3+4	7·3
24	2348	F	AB	e−2, 3+3	7·3*b*
25	2349	,,	,,	e−3, 3+3	7·4
26	2350	45	Bh	=3, 5+5	7·7
29	2353	23	Bo	2 (3) v (1) 3	7·3*b*
29	2353	F	AB	e−3, 3+3	7·3
31	2355	30	Bn	d (1) v (1) 3	7·2
1920 Feb 1	2356	23	Bo	2 (2) v (1) 3	7·1
1	2356	25	AB	e−1	7·2
3	2358	F	,,	e+1	7·0*b*
3	2358	22	Ni	3+5, 5+6	7·4
4	2359	45	Bh	=3, =4, 5+5	7·8
4	2359	F	AB	e−1	7·2*b*
5	2360	,,	,,	F−1, f+1	7·4
6	2361	25	Bn	d (1) v (4) 3	6·9
6	2361	50	Ma	2 (2) v (1) 5	7·4
7	2362	23	Bo	2 (2) v (1) 3	7·1
7	2362	F	AB	e−2, F+1	7·3
8	2363	,,	,,	F−2, 3+1·5	7·5
8	2363	30	Bn	b (2) v (1) d	6·5
8	2363	,,	D	e+5	6·6
8	2363	90	Wh	2 (1) v (1) 5	7·1
11	2366	23	Bo	2 (3) v (1) 3	7·3
11	2366	45	Bh	2−15, 3+2, 4+3, 5+7·5	7·5
13	2368	F	AB	3−2, 5+4	7·8
14	2369	,,	,,	F−3, 3+2	7·5
15	2370	,,	,,	3+1	7·6*b*
15	2370	23	Bo	2 (4) v (1) 3	7·4
15	2370	22	Ni	3+5	7·2*b*
17	2372	45	Bh	3+2, 5+8	7·4
17	2372	30	Bn	d (3) v (1) 3	7·5
18	2373	25	AB	=3, 5+5	7·7
18	2373	30	D	3+2	7·5*b*
19	2374	50	Tm	5+1	8·1*b*
19	2374	,,	Ma	5+3·5	7·8
19	2374	23	Bo	3 (1) v (1) 4	7·8
21	2376	50	Ma	2 (4) v (1) 5, 5+4	7·7

Jan. 1, Unsteady.

Feb. 19, Ma, Pale yellow.

(3825) R URSÆ MAJORIS—*continued.*

1920					
Feb					
22	2377	23	Bo	3 (1) v (3) 4	7·8
22	2377	22	Ni	3+2·5, 5+5	7·6*b*
23	2378	50	Tm	5+2	8·0
23	2378	45	Bh	3+2, 4+3, 5+8	7·5
24	2379	50	Ma	2 (9) v (1) 5, 5+2·5	7·9
26	2381	,,	Tm	5+1	8·1
26	2381	,,	Ma	2 (7) v (1) 5, 5+2·5	7·9
26	2381	90	Wh	5−2	8·4
27	2382	23	Bo	3 (1) v (1) 4	7·8
27	2382	45	Bh	5+5	7·7
29	2384	25	AB	3−2, 5+3	7·9
Mar					
1	2385	22	Ni	3+3, 5+5	7·5
2	2386	50	Ma	5+2	8·0
2	2386	30	Bn	3 (1) v (1) 4	7·8
2	2386	50	Tm	=5	8·2
3	2387	,,	,,	5+1	8·1
3	2387	45	Bh	3−2, 5+3	7·9
3	2387	23	Bo	3 (4) v (1) 4	7·9
3	2387	25	AB	3−3, 5+2	8·0*b*
7	2391	30	Bn	4+1	7·9
7	2391	45	Bh	5+1	8·1*b*
8	2392	23	Bo	3 (1) v (3) 4	7·8
8	2392	50	Ma	5+4·5	7·7
8	2392	,,	Tm	5 2	8·4
11	2395	,,	,,	5−2	8·4*b*
11	2395	F	AB	5+1	8·1*b*
11	2395	50	Ma	=5	8·2
11	2395	90	Bh	5+2	8·0
12	2396	50	Bn	4 (1) v (3) 5	8·0
12	2396	23	Bo	4 (3) v (1) 5	8·1
12	2396	30	D	5−1	8·3*b*
12	2396	50	Tm	5 (1) v (14) 6	8·3
12	2396	90	Wh	=5	8·2
14	2398	F	AB	5−1, B+2·5	8·3*b*
15	2399	50	Ma	5−1·5	8·3
16	2400	23	Bo	3 (3) v (1) 4	7·9
17	2401	90	Bh	5+1	8·1
18	2402	50	Tm	5 (1) v (11) 7	8·3*b*
18	2402	,,	Bn	4 (1) v (1) 5	8·1
19	2403	23	Bo	4 (3) v (1) 5	8·1
19	2403	25	AB	5−1·5, B+1·5	8·4
19	2403	30	D	5 −2, 1+5	8·3
20	2404	50	Bn	4 (3) v (4) 5	8·0
20	2404	,,	Ma	5 (1) v (4) 7	8·5
20	2404	,,	Tm	5 (1) v (19) 7	8·3
21	2405	25	AB	5−1, B+1	8·5
22	2406	50	Tm	5 (1) v (7) 7	8·4
22	2406	90	Bh	5+1	8·1
22	2406	25	AB	5 −4, =B	8·6
22	2406	22	Ni	5 (5) v (1) 1	8·7
23	2407	50	Tm	5 (1) v (4) 6	8·5*b*
25	2409	90	Bh	=5	8·2
26	2410	25	AB	B− 2, m+7·5	8·7*b*
28	2412	22	Ni	1 (1·5) v (6) m	8·9*b*
30	2414	23	Bo	5 (1) v (4) 7	8·5
31	2415	90	Bh	5−2	8·4
31	2415	50	Tm	5 (1) v (4) 7	8·5*b*
Apr					
6	2421	,,	,,	5 (2) v (3) 7	8·8*b*
6	2421	25	AB	B− 5·5, m+3·5	9·1
6	2421	23	Bo	5 (1) v (2) 7	8·7
10	2425	22	Ni	1 (6) v (2·5) m	9·2
10	2425	90	Bh	5−4, 7+12	8·6
11	2426	25	AB	B −6, m+2	9·2
12	2427	45	Bh	5−5	8·7
12	2427	50	Tm	5 (2) v (1) 7	9·2
13	2428	30	D	1 −3, m+3	9·1

1920					
Apr					
15	2430	23	Bo	5 (1) v (1) 7	9·
16	2431	30	Bn	k (3) v (1) 7, m (1) v (3) 7	9·
16	2431	90	Bh	5−6, 7+9	8·
16	2431	50	Tm	5 (2) v (1) 7	9·
19	2434	,,	,,	5 (4) v (1) 7	9·
20	2435	22	Ni	m (1) v (4) 10	9·
21	2436	30	Bn	m (2) v (1) 7	9·
21	2436	90	Bh	5−8, 7+8	9·
21	2436	60	D	7+1·5	9·
21	2436	50	Tm	5 (5) v (1) 7	9·
22	2437	80	AB	m−2, 7+3	9·
23	2438	50	Tm	5 (5) v (1) 7	9·
25	2440	,,	,,	5 (7) v (1) 7	9·
27	2442	90	Bh	7+3	9·
29	2444	50	Tm	5 (7) v (1) 7	9·
May					
2	2447	,,	,,	=7	9·
3	2448	75	Bn	9 (1) v (2) 12	10·
4	2449	90	Bh	7−4, =6	10·
4	2449	50	Tm	7 (1) v (9) 12, =7	9·
5	2450	80	AB	C−4, 10+3	10·
7	2452	50	Tm	=7	9·
7	2452	60	D	12+2	10·
8	2453	22	Ni	m (3) v (1) 10	10·
9	2454	50	Bn	9 (2) v (1) 10	10·
9	2454	,,	Tm	=7	9·
12	2457	,,	,,	7 (1) v (5) 12	9·
12	2457	30	D	=12	10·
13	2458	90	Bh	7−5, 12+5	10·
13	2458	50	Bn	10 (2) v (1) 12	10·
14	2459	,,	Tm	7 (3) v (1) 12	10·
16	2461	80	AB	12−3, 14+5	11·
17	2462	90	Wh	14+2	11·
18	2463	79	Ma	12−1	10·
19	2464	50	Tm	=12	10·
19	2464	120	Bn	=12	10·
21	2466	90	Bh	7−8, 12+1	10·
21	2466	60	D	<12	<10·
21	2466	94	Ni	12 (5) v (5) 14	11·
22	2467	90	Wh	=14	11·
22	2467	79	Ma	12 (3) v (1) 14	11·
23	2468	50	Bn	12 (1) v (2) 14	11·
23	2468	,,	Tm	12 (2) v (3) 14	11·
27	2472	80	AB	14+2	11·
June					
2	2478	90	Bh	14+4	11·
3	2479	79	Ma	14+2, 18+4	11·
4	2480	90	Bh	14+1	11·
5	2481	120	Bn	14 (1) v (2) 18	11·
6	2482	80	AB	=14	11·
7	2483	183	Ma	=14	11·
8	2484	94	Ni	=14	11·
9	2485	150	Bn	14 (3) v (2) 18	11·
13	2489	183	Ma	14−1	11·
19	2495	120	Bn	18 (2) v (1) 23	12·
19	2495	90	Bh	14−1	11·
20	2496	80	AB	14−1·5, 18+2	11·
20	2496	90	Wh	14−3	11·
22	2498	30	D	<14	<11·
23	2499	90	Bh	14−5, 18+1	12·
23	2499	80	AB	18−0·5	12·
29	2505	90	Bh	18−1	12·

June 3, Very difficult.
June 7, Difficult.

(3825) R URSÆ MAJORIS—*continued.*

1920 July					
9	2515	94	Ni	23 (1) v (3) 27	12·7
10	2516	80	AB	23−1·5	12·7
14	2520	94	Ni	23 (4) v (1) 27	13·0
15	2521	150	Bn	23 (3) v (1) 29	13·0
18	2524	183	Ma	23 (1) v (1) 29	12·8
19	2525	94	Ni	23 (4·5) v (1·5) 27	13·0
19	2525	90	Bh	18−5	12·5
24	2530	183	Ma	23 (1) v (1) 29	12·8
24	2530	150	Bn	23 (3) v (1) 29	13·0
27	2533	90	Bh	18−6, =23	12·6
Aug					
2	2539	,,	,,	=26	12·8
4	2541	94	Ni	23 (4) v (1) 27	13·0*b*
5	2542	79	Ma	=29	13·1
7	2544	183	,,	29−1	13·2
9	2546	,,	,,	29−1	13·2
13	2550	90	Bh	23−5, 26−2	13·0*b*
15	2552	183	Ma	=29	13·1
17	2554	160	Bo	=29	13·1*b*
20	2557	90	Bh	23−5, 26−2	13·0
22	2559	183	Ma	23−5	13·0
Sept					
1	2569	150	Bh	26−2, 29+2	13·0
4	2572	183	Ma	29−3	13·4
6	2574	,,	,,	23 (1) v (2) 29	12·7
8	2576	160	Bo	23 (1) v (3) 29	12·7
9	2577	94	Ni	23 (3) v (2) 27	12·9
12	2580	90	Bh	23−3, =26	12·8
13	2581	183	Ma	=29	13·1
14	2582	160	Bo	18 (4) v (1) 23	12·4
16	2584	90	Bh	23−2, 28+4	12·7
16	2584	183	Ma	23 (2) v (1) 29	12·9
16	2584	94	Ni	23 (4) v (2) 27	12·9
18	2586	95	Bn	23−1	12·6*b*
19	2587	160	Bo	18 (1) v (1) 23	12·3
19	2587	90	Wh	18 (1) v (1) 23	12·3*b*
22	2590	,,	Bh	=23	12·5
25	2593	,,	,,	18−4, 23+1	12·4
Oct					
2	2600	,,	,,	18−2, 23+2	12·3
2	2600	120	Bn	14 (3) v (1) 18	11·9
3	2601	160	Bo	14 (3) v (1) 18	11·9
3	2601	80	AB	23−1	12·6*b*
4	2602	94	Ni	20 (3) v (3) 23	12·4
6	2604	79	Ma	14 (4) v (1) 18	11·9
6	2604	90	Bh	18−2·5	12·3
6	2604	50	Tm	18 (1) v (1) 23	12·3*b*
9	2607	,,	,,	18−2	12·2*b*
9	2607	90	Bh	18−1, 23+4	12·1
9	2607	160	Bo	17 (1) v (1) 18	11·9
10	2608	,,	,,	14 (2) v (1) 18, =17	11·8
10	2608	94	Ni	17 (2) v (2) 20	12·0
11	2609	120	Bn	14 (2) v (1) 18	11·8
12	2610	90	Bh	14−3, 18+1	11·9
13	2611	79	Ma	14 (1) v (1) 18	11·8
13	2611	80	AB	14−4·5, 18+1·5	11·9*c*
14	2612	55	Bo	14 (1) v (1) 16	11·6
18	2616	94	Ni	12 (7) v (1) 14	11·4
18	2616	90	Bh	14+1	11·4
18	2616	50	Bn	13 (2) v (1) 14	11·3
19	2617	130	Bo	13 (3) v (1) 14	11·4
22	2620	90	Bh	12+2, 14+10	10·5
23	2621	45	,,	7−5, 12+5	10·2
24	2622	,,	,,	7−1, =6	9·9

Aug. 5, About.
Oct. 6, Bh, Unsteady.

1920 Oct					
24	2622	50	Bn	9 (2) v (1) 10	10·4
24	2622	94	Ni	m (4) v (1) 10	10·3
25	2623	90	Bh	7+1	9·7
26	2624	55	Bo	5 (3) v (1) 7	9·4
27	2625	50	Bn	7 (1) v (2) 9	9·9
28	2626	94	Ni	m+3	9·1
29	2627	80	AB	m−1·5, 7+4·5	9·4
29	2627	50	Bn	m+1	9·3
29	2627	45	Bh	7+3	9·5
30	2628	90	,,	7+5, 6+5	9·3
30	2628	55	Bo	5 (1) v (2) 7	8·7
31	2629	25	AB	B−6·5, m+3	9·2
Nov					
1	2630	30	D	5 (4) v (1) 7, 7+3	9·4*b*
1	2630	,,	Bn	B (3) v (1) m	9·2
1	2630	45	Bh	5−6, 7+10	8·8
3	2632	,,	,,	5−5, 7+10	8·7
4	2633	22	Ni	5 (5) v (1·5) 1	8·7
4	2633	25	AB	B−2, m+5·5	8·8
4	2633	30	Bn	B (5) v (2) m	9·2
4	2633	55	Bo	=5	8·2
5	2634	45	Bh	5−3	8·5
6	2635	25	Bn	B (3) v (2) m	9·1
8	2637	30	D	5−1	8·3
8	2637	45	Bh	=3, 4+1, 5+3	7·8
8	2637	55	Bo	4 (1) v (1) 5	8·1
10	2639	25	AB	5−1, B+3	8·3
11	2640	,,	Bn	4 (1) v (1) 5	8·1
11	2640	45	Bh	=3, =4, 5+3	7·8
13	2642	90	,,	5+3	7·9*b*
13	2642	25	AB	3−3, 5+2	8·0
15	2644	30	Bn	3 (2) v (1) 4	7·9
15	2644	45	Bh	3+1, 4+3, 5+5	7·6
16	2645	30	D	3−4, 5+1·5	8·1*b*
16	2645	22	Ni	=5	8·2
16	2645	55	Bo	3+2	7·5
18	2647	25	AB	3−1, 5+4	7·8
18	2647	30	D	3−3, 5+2	8·0
18	2647	50	Ma	5+4	7·8
20	2649	55	Bo	3 (1) v (3) 4	7·8
20	2649	30	Bn	3 (3) v (2) 4	7·9
20	2649	90	Bh	5+3	7·9
21	2650	22	Ni	3+1, 5+3	7·7
22	2651	25	AB	=3	7·7
23	2652	,,	Bn	3 (1) v (1) 4	7·8
30	2659	90	Bh	5+4	7·8
Dec					
1	2660	55	Bo	3 (1) v (3) 4	7·8
1	2660	25	AB	3+2	7·5*b*
1	2660	50	Tm	2 (7) v (1) 5	7·9*b*
4	2663	,,	,,	2 (5) v (1) 5	7·8
4	2663	22	Ni	3+3, 5+4	7·6
8	2667	90	Bh	5+2	8·0*b*
9	2668	30	Bn	3 (3) v (2) 4	7·9
10	2669	45	Bh	3−2, 5+2	7·9
12	2671	55	Bo	2 (3) v (1) 3	7·3
14	2673	50	Tm	=5	8·2
17	2676	90	Bh	=5	8·2
20	2679	25	AB	3−3, 5+2	8·0*b*
21	2680	90	Bh	5+2	8·0
22	2681	22	Ni	=5	8·2
22	2681	55	Bo	2 (9) v (1) 3	7·5
26	2685	90	Bh	5+2	8·0
28	2687	45	,,	5+2	8·0

Oct. 28, With 22, 9·2.
Oct. 29, Bn, With 30, 9·3.

(3825) R URSÆ MAJORIS—*continued.*

1920 Dec 28	2687	30	Bn	4 (3) v (2) 5	8·1
30	2689	25	AB	3−5, 5+1	8·1*b*
31	2690	90	Bh	5+1	8·1
1921 Jan 1	2691	25	AB	5+1	8·1
6	2696	,,	,,	B−1, m+6	8·8
6	2696	90	Bh	=5	8·2
12	2702	22	Ni	=l	8·8
12	2702	30	Bn	B (2) v (1) m	9·2
13	2703	25	AB	B−5, m+3	9·1
13	2703	90	Bh	5−2	8·4
14	2704	55	Bo	5 (1) v (7) 7	8·4
14	2704	32	Ca	5−6, k+1, =l	8·8
14	2704	50	Ma	5 (1) v (2) 7	8·7*c*
16	2706	22	Ni	l (3) v (3) m	9·1
16	2706	80	AB	B−6, m+3	9·2
16	2706	30	D	5 (4) v (1) 7, 7+3	9·4*b*
21	2711	90	Bh	5−5, 7+10	8·7
27	2717	55	Bo	5 (2) v (1) 7	9·2
27	2717	90	Bh	5−10, 7+5	9·2
29	2719	80	AB	m+3	9·1*b*
30	2720	45	Bh	7+3	9·5
30	2720	60	D	7−6, 12+3	10·4
31	2721	32	Ca	m−4, =7, C+1	9·8
31	2721	80	AB	=6	9·9
31	2721	50	Bn	m+1·5	9·3
31	2721	55	Bo	5 (3) v (1) 7	9·4
Feb 2	2723	90	Bh	7+1	9·7
3	2724	80	AB	=7	9·8
4	2725	79	Ma	=7	9·8*b*
5	2726	,,	,,	7+2	9·6
5	2726	55	Bo	5 (3) v (1) 7	9·4
9	2730	50	Ma	7+1	9·7
9	2730	45	Bh	=9, =10	10·4
12	2733	94	Ni	=12	10·7
12	2733	80	AB	7−3	10·1
13	2734	,,	,,	7−4	10·2
14	2735	79	Ma	7 -2	10·0
14	2735	50	Bn	10 (1) v (1) 12	10·6
15	2736	80	AB	10−2	10·7*b*
17	2738	50	Ma	12−1	10·8
18	2739	90	Bh	10−1, 12+1	10·6
19	2740	55	Bo	7 (3) v (1) 12	10·5
19	2740	94	Ni	12 (3) v (3) 14	11·1
20	2741	90	Bh	=12	10·7
24	2745	160	Bo	12 (1) v (2) 13	10·8
24	2745	50	Bn	12 (1) v (2) 13	10·8
24	2745	25	AB	13−3, 14+3	11·3
25	2746	,,	,,	14+3	11·2*b*
25	2746	90	Bh	12−1	10·8
25	2746	32	Ca	10−3, 13+2	10·8
26	2747	94	Ni	12 (6) v (2·5) 14	11·3
27	2748	79	Ma	14+5, 18+7	11·2
Mar 1	2750	50	Bn	13 (1) v (2) 14	11·2
2	2751	55	Bo	13 (1) v (3) 14	11·1
2	2751	90	Bh	14+5, 18+10	11·0
3	2752	80	AB	=14	11·5
5	2754	90	Bh	14+3	11·2
7	2756	50	Bn	13 (3) v (1) 14	11·4
10	2759	160	Bo	13 (3) v (1) 14	11·4
10	2759	90	Bh	14+2	11·3
11	2760	80	AB	14−1	11·6*b*

Feb. 14, Ma, Difficult.

1921 Mar 12	2761	94	Ni	=14	11
14	2763	80	Ca	13−5, =14, 18+5	11
15	2764	225	Bo	13 (3) v (1) 14	11
17	2766	90	Bh	=14	11
18	2767	120	Bn	14 (2) v (1) 18	11
21	2770	90	Bh	=14	11
25	2774	94	Ni	=17	11
26	2775	120	Bn	18 (2) v (1) 23	12
29	2778	90	Bh	14−2, 18+4	11
30	2779	140	Bo	18 (3) v (1) 19	12
30	2779	120	Bn	18 (2) v (1) 23	12
Apr 1	2781	80	AB	18−3, 23+2	12
2	2782	140	Bo	19 (1) v (3) 20	12
4	2784	60	D	<18	<12
6	2786	120	Bn	18 (3) v (1) 23	12
7	2787	140	Bo	19 (1) v (1) 20	12
7	2787	90	Bh	14−4, 18+2	11
9	2789	94	Ni	20 (4) v (2·5) 23	12
12	2792	90	Bh	=18	12
12	2792	140	Bo	20 (1) v (1) 23	12
18	2798	160	,,	20 (3) v (1) 23	12
23	2803	90	Bh	18−2	12
26	2806	,,	,,	18−3, 23+2	12
27	2807	120	Bn	23−3	12
28	2808	225	Bo	23 (3) v (1) 27	13
29	2809	120	Bn	23 (2) v (1) 29, 27+3	12
29	2809	94	Ni	23 (2) v (2) 27	12
30	2810	90	Bh	18−4, 23+1	12
May 7	2817	,,	,,	<18	<12
9	2819	120	Bn	23 (4) v (1) 29	13
10	2820	225	Bo	23 (3) v (2) 27	12
11	2821	94	Ni	23 (3) v (1) 27	13
15	2825	90	Bh	23−2	12
20	2830	160	Bo	27 (1) v (1) 29	13
23	2833	183	Ma	18−6	12
24	2834	120	Bn	23 (4) v (1) 29	13
24	2834	90	Bh	<23	<12
26	2836	94	Ni	27−1	13
31	2841	90	Bh	23−2	12
June 1	2842	160	Bo	23 (1) v (1) 27	12
2	2843	90	Bh	<23	<12
5	2846	,,	,,	23−3	12
5	2846	94	Ni	23 (4) v (1) 27	13
6	2847	120	Bn	23 (3) v (1) 29	13
10	2851	90	Bh	23−5	13
11	2852	79	Ma	<23	<12
14	2855	160	Bo	23 (1) v (3) 27	12
21	2862	90	Bh	<23	<12
27	2868	150	,,	23−3	12
28	2869	120	Bn	18 (3) v (1) 23	12
July 2	2873	90	Bh	23−1	12
2	2873	94	Ni	20 (4) v (1) 23	12
5	2876	120	Bn	14 (4) v (1) 18	11
5	2876	79	Ma	18+1·5	11
7	2878	90	Bh	18−3, 23+2	12
7	2878	94	Ni	20 (1) v (5) 23	12
9	2880	120	Bn	14 (2) v (1) 18	11

April 6, t.
May 23, Only just held.
May 24, June 21, Bh, Not seen.
May 31, Difficult.
June 11, Invisible.

(3825) R URSÆ MAJORIS—*continued.*

1921 July					
n 9	2880	80	AB	18+1	11·9*b*
n 10	2881	60	D	<14	<11·5
n 11	2882	90	Bh	23+1	12·4*b*
n 12	2883	94	Ni	14 (4) v (1) 23	12·3
n 18	2889	90	Bh	14−3, 18+3	11·8*b*
n 21	2892	79	Ma	14−1	11·6*b*
n 23	2894	80	AB	14+1	11·4*b*
n 25	2896	120	Bn	13+1·5	10·9
n 26	2897	80	AB	14+1	11·4*b*
n 29	2900	25	,,	10−5, 14+3	11·1*b*
n 29	2900	90	Bh	12−3, 14+5	11·0
31	2902	25	AB	10−4, 13+2	10·8
n 31	2902	60	D	<12	<10·7*b*
n Aug					
n 3	2905	50	Ma	10−1	10·6
n 3	2905	80	Ca	10−3, 13+2	10·8
n 4	2906	25	AB	10−3, 13+4	10·7
n 5	2907	,,	,,	10−2, 13+4	10·6
n 6	2908	90	Bh	7−3, 12+6	10·1
n 7	2909	,,	,,	=7	9·8
n 9	2911	30	Bn	7 (2) v (1) 9	10·1
n 9	2911	79	Ma	=7	9·8
n 13	2915	50	,,	5 (4) v (1) 7	9·4
n 14	2916	45	Bh	5−10, 7+6	9·2*b*
n 18	2920	22	Ni	5 (6) v (2·5) m	9·1
n 18	2920	55	Bo	5 (1) v (3) 7	8·6
n 19	2921	45	Bh	5−7, 7+9	8·9
n 22	2924	,,	,,	5−3	8·5
n 24	2926	55	Bo	4 (1) v (1) 5	8·1
n 25	2927	30	Bn	4 (1) v (1) 5	8·1
n 25	2927	90	Bh	5−1	8·3
n 25	2927	50	Ma	5+1	8·1
n 26	2928	22	Ni	5 (1·5) v (5) 1	8·3
n 27	2929	25	AB	5−2, B+2	8·4
n 28	2930	,,	,,	5+1	8·1
n 28	2930	60	D	=5	8·2
n 29	2931	50	Ma	2 (7) v (1) 5, 5+3	7·9
n 30	2932	25	AB	3−2, 5+3	7·9
n 30	2932	45	Bh	5+2	8·0
n 30	2932	30	D	5+1	8·1
n 31	2933	,,	,,	3−3, 5+2	8·0
n 31	2933	55	Bo	3 (2) v (1) 4	7·9
Sept					
n 3	2936	60	D	2 (6) v (1) 3, 3+3	7·4*b*
n 3	2936	30	Bn	3+1	7·6
n 4	2937	45	Bh	5+5	7·7
4	2937	80	Ca	b−10, 3+5	7·2
n 5	2938	55	Bo	2 (5) v (1) 3	7·4
n 5	2938	30	Bn	f (3) v (2) 3	7·6
n 6	2939	,,	D	2 (2) v (1) 3, 3+5	7·1
n 6	2939	45	Bh	3+3, 5+6	7·5
n 7	2940	22	Ni	3+3	7·4
n 7	2940	30	Bn	f+1, 3+3	7·4
9	2942	,,	,,	f+2	7·3
10	2943	90	Bh	5+6	7·6
14	2947	30	D	b (3) v (2) 3, 3+6	7·1
15	2948	,,	Bn	d−5, f+3	7·2
16	2949	,,	D	b (3) v (4) 3, 3+5	7·0*b*
16	2949	45	Bh	3+4, 5+8	7·3
21	2954	,,	,,	5+8	7·4
21	2954	55	Bo	2 (1) v (1) 3	6·8
21	2954	50	Bn	d−5, f+3	7·2
21	2954	30	D	b (4) v (1) 3, 3+5	7·3*b*
23	2956	,,	,,	b (3) v (1) 3, 3+4	7·3
1921 Sept					
23	2956	22	Ni	d (6) v (4) M	7·1
24	2957	90	Bh	5+8	7·4
25	2958	30	Bn	d−5, f+4	7·1
26	2959	55	Bo	2 (2) v (1) 3	7·1
27	2960	25	Bn	d (2) v (1) f	7·2
27	2960	30	D	b (4) v (1) 3, 3+3·5	7·4
28	2961	90	Bh	5+8	7·4
30	2963	,,	,,	5+6	7·6
30	2963	30	D	3+4	7·3
Oct					
1	2964	55	Bo	2 (2) v (1) 3	7·1
1	2964	30	Bn	d (7) v (3) f	7·2
4	2967	50	Ma	2 (4) v (1) 5	7·7
5	2968	30	D	3+3	7·4
5	2968	45	Bh	3+4, 5+8	7·3
5	2968	30	Bn	d (7) v (3) f	7·2
7	2970	55	Bo	2 (3) v (1) 3	7·3
8	2971	45	Bh	3+5, 5+9	7·2
9	2972	80	Ca	b−12, 3+3	7·4
9	2972	22	Ni	d (6) v (2) M, d (6) v (4) 3	7·2
14	2977	25	Bn	f+2, 3+4	7·3
15	2978	45	Bh	2−12, 5+9	7·2
16	2979	55	Bo	2 (3) v (1) 3	7·3*b*
17	2980	45	Bh	2−13, 3+5, 5+10	7·2
23	2986	90	,,	5+4	7·8
23	2986	25	Bn	f+2	7·3
24	2987	22	Ni	3−2	7·9
27	2990	90	Bh	5+2	8·0
30	2993	55	Bo	3 (1) v (2) 4	7·8*b*
Nov					
1	2995	50	Bn	3 (3) v (1) 4	7·9
6	3000	55	Bo	4 (1) v (1) 5	8·1
7	3001	50	Bn	4 (2) v (1) 5	8·1
7	3001	90	Bh	5+2	8·0
10	3004	22	Ni	5 (7) v (1·5) 1	8·7
10	3004	50	Bn	5 (3) v (1) B	8·5
11	3005	55	Bo	5 (1) v (9) 7	8·3*b*
12	3006	45	Bh	5+2	8·0
17	3011	55	Bo	5 (1) v (7) 7	8·4*b*
22	3016	,,	,,	5 (1) v (3) 7	8·6
22	3016	22	Ni	1 (4) v (2·5) m	9·2
23	3017	90	Bh	5−4	8·6
23	3017	30	Bn	B (4) v (1) m	9·3*b*
24	3018	,,	D	5 (5) v (1) 7, 7+3	9·5
25	3019	55	Bo	5 (1) v (3) 7	8·6*b*
29	3023	90	Bh	7+5	9·3
30	3024	94	Ni	1 (6) v (1·5) m	9·3
Dec					
3	3027	45	Bh	7+2	9·6
15	3039	90	,,	7−2, 12+6	10·0
17	3041	55	Bo	5 (7) v (1) 7	9·6
20	3044	50	Bn	10 (1) v (1) 12	10·6
21	3045	90	Bh	=12, 14+8	10·7
24	3048	94	Ni	12 (1) v (7) 14	10·8
25	3049	90	Bh	=12, 14+6	10·8
26	3050	55	Bo	9 (1) v (1) 10	10·4
28	3052	94	Ni	=12	10·7
30	3054	90	Bh	12−2, 14+5	10·9
31	3055	75	Bn	10 (2) v (1) 13	10·8

July 21, If no mistake in identification.
Sept. 16, D, Difficult.

Oct. 4, Pale red.
Nov. 23, Bh, Light blue.
Dec. 24, With 22, 10·9.
Dec. 28, With 22, 10·7.

(3825) R URSÆ MAJORIS—*continued.*

1922					
Jan					
1	3056	90	Bh	12−2, 14+3	11·0
3	3058	,,	,,	12−3, 14+5	11·0
4	3059	,,	Wh	14+3	11·2
6	3061	55	Bo	10 (1) v (4) 13	10·6
6	3061	94	Ni	12 (4) v (3·5) 14	11·1
10	3065	90	Bh	14+2, 18+6	11·4*b*
12	3067	140	Bo	13 (1) v (3) 15	11·1*b*
16	3071	79	Ma	14+1·5	11·3
16	3071	55	Bo	13 (1) v (3) 15	11·1
17	3072	85	Bn	14 (1) v (2) 18	11·7
18	3073	90	Bh	14+2	11·3
20	3075	,,	,,	=14	11·5
30	3085	140	Bo	18 (2) v (3) 23	12·2*b*
Feb					
2	3088	160	,,	18 (2) v (3) 23	12·2
2	3088	90	Bh	14−2, 18+2	11·8
5	3091	,,	,,	14−3, 18+1	11·9
5	3091	160	Bo	18 (3) v (2) 23	12·3
8	3094	275	,,	18 (3) v (2) 23	12·3
11	3097	94	Ni	17 (3) v (2) 20	12·1*b*
14	3100	160	Bo	18 (3) v (2) 23	12·3
17	3103	120	Bn	18 (4) v (1) 23	12·4
17	3103	90	Bh	18−2, 23+2	12·3
18	3104	160	Bo	18 (3) v (2) 23	12·3
19	3105	130	Ma	18−2, 23+2	12·3
24	3110	,,	,,	23−1	12·6
25	3111	140	Bo	18 (3) v (2) 23	12·3*b*
25	3111	94	Ni	23 (2) v (3) 27	12·8
26	3112	120	Bn	18 (5) v (1) 23	12·4
26	3112	90	Wh	=23	12·5
27	3113	275	Bo	18 (4) v (1) 23	12·4
Mar					
2	3116	,,	,,	23−1	12·6
4	3118	120	Bn	23−1	12·6*b*
4	3118	90	Bh	23−2, =26	12·8
7	3121	120	Bn	23−2	12·7*b*
9	3123	130	Ma	18−5, 23−1, =29	12·8
15	3129	90	Bh	=26	12·8
16	3130	275	Bo	23 (2) v (4) 27	12·7*b*
18	3132	94	Ni	23 (5) v (1) 27	13·0
19	3133	90	Bh	23−4, =26	12·9
20	3134	130	Ma	=29	13·1*b*
22	3136	90	Wh	22 (1) v (1) 29	12·8
22	3136	,,	Bh	26−1	12·9
23	3137	275	Bo	27−1	13·2*b*
25	3139	120	Bn	23−3, 29+3	12·8
28	3142	90	Bh	23−4, 26−1	12·9*b*
31	3145	94	Ni	27 (3) v (3) 10	13·3
Apr					
1	3146	120	Bn	23 (3) v (1) 29	13·0
2	3147	94	Ni	27 (1·5) v (3) w	13·2*b*
4	3149	90	Bh	=26	12·8
16	3161	160	Bo	27 (1) v (1) 29	13·1
18	3163	150	Bh	23−4, 26−1	12·9
19	3164	85	Bn	23−2	12·7*b*
20	3165	275	Bo	27 (1) v (1) 29	13·1
29	3174	90	Bh	26−2	13·0
May					
2	3177	,,	,,	26−2	13·0
4	3179	275	Bo	23 (3) v (3) 27	12·8*b*
4	3179	120	Bn	23−2	12·7
6	3181	90	Bh	=23	12·5*b*
12	3187	,,	,,	18−3, 23+2	12·3*b*
14	3189	140	Bo	14 (4) v (1) 18	11·9
14	3189	120	Bn	18 (2) v (1) 23	12·4
17	3192	90	Bh	14−3, 18+2	11·8
19	3194	120	Bn	18 (2) v (1) 23	12·4
20	3195	275	Bo	14 (2) v (3) 18	11·7

1922					
May					
21	3196	94	Ni	=23	12
21	3196	90	Bh	14−2, 18+3	11
22	3197	62	D	<14	<11
23	3198	79	Ma	14 (3) v (1) 18	11
24	3199	80	Ca	14−3, 18+2	11
26	3201	90	Bh	14−1	11
27	3202	,,	,,	14+1	11
27	3202	160	Bo	14 (3) v (2) 18	11
27	3202	120	Bn	18 (1) v (3) 23	12
28	3203	94	Ni	20 (2) v (3) 23	12
31	3206	90	Bh	14+1	11
June					
1	3207	94	Ni	14 (3) v (3) 20	11·
4	3210	120	Bn	14 (1) v (1) 18	11·
4	3210	90	Bh	=14	11·
12	3218	45	,,	10−4, 14+6	10·
16	3222	55	Bo	7 (4) v (3) 10	10·
18	3224	62	Wf	7−5, 12+4	10·
19	3225	45	Bh	7−4, 10+4	10·
20	3226	80	Co	=8, 9+3	10·
22	3228	32	Ca	k−1, m+4	9·
22	3228	45	Bh	7+4	9·
25	3231	80	Co	7+3	9·
26	3232	62	Wf	5−6, 7+7	8·
26	3232	45	Bh	5−8, 7+7	9·
28	3234	50	Ma	5 (1) v (3) 7	8·
29	3235	80	Co	5−3·5	8·
29	3235	45	Bh	5−3	8·
July					
2	3238	,,	,,	5+1	8·
3	3239	32	Ca	5−3, 1+3	8·
10	3246	45	Bh	2−15, 5+7	7·
11	3247	80	Co	5+1	8·
12	3248	22	Ni	5 (1·5) v (7) 1	8·
14	3250	45	Bh	2−15, 5+7	7·
18	3254	50	Ma	5+3·5	7·
18	3254	,,	Bn	4 (1) v (1) 5	8·
18	3254	80	Co	=3, 5+3	7·
20	3256	45	Bh	2−15, =3, 5+7	7·
20	3256	32	Ca	b−12, 3+3	7·
20	3256	80	Co	=5	8·
22	3258	62	Wf	5+7	7·
27	3263	45	Bh	=3, 5+5	7·
30	3266	50	Bn	3 (3) v (1) 4	7·
30	3266	80	Co	5+0·5	8·
31	3267	,,	,,	=5	8·
31	3267	50	Ma	2 (7) v (1) 5	7·
31	3267	55	Bo	3+3	7·
Aug					
5	3272	90	Bh	5+5	7·
6	3273	62	Wf	=3, 4+3, 5+7	7·
7	3274	22	Ni	3 (1) v (4) 5	7·
7	3274	30	Bn	3 (2) v (1) 4	7·
11	3278	45	Bh	3−1, 4+1, 5+4	7·
13	3280	62	Wf	3−1, 4+1, 5+3	7·
15	3282	30	D	3 (4) v (1) 4, 5+2	7·
15	3282	,,	Bn	3 (3) v (1) 4	7·
15	3282	80	Co	5+1	8·
16	3283	55	Bo	3 (1) v (2) 4	7·
17	3284	50	Ma	2 (4) v (1) 5, 5+5	7·
17	3284	22	Ni	5, (1·5) v (7) 1	8·
17	3284	80	Co	=5	8·

June 26, Wf, Red.
July 22, Orange-red.
July 31, Aug. 17, Co, White.
Aug. 15, D, 3-in.

(3825) R URSÆ MAJORIS—*continued.*

1922 Aug.					
7	3284	45	Bh	5+3	7·9
8	3285	,,	,,	5+2	8·0
9	3286	30	Co	=5	8·2
10	3287	,,	,,	5−2	8·4
10	3287	45	Bh	=5	8·2
10	3287	55	Bo	3 (1) v (2) 4	7·8
10	3287	22	Ni	5 (2) v (6) 1	8·3
11	3288	62	Wf	=5	8·2
13	3290	30	Co	5+0·5	8·1
13	3290	50	Ma	5+1	8·1
13	3290	30	Bn	4 (2) v (1) 5	8·1
13	3290	90	Bh	5+1	8·1
15	3292	,,	,,	5−1	8·3
17	3294	30	Co	5−1	8·3*b*
19	3296	22	Ni	5 (5) v (1) 1	8·7
19	3296	90	Bh	=5	8·2
31	3298	,,	,,	5−2	8·4
31	3298	30	Bn	5 (1) v (1) B	8·4
31	3298	,,	Co	5−2	8·4
Sept.					
7	3305	13	Bo	5−4	8·6*b*
7	3305	90	Bh	5−4	8·6
9	3307	30	Bn	B (5) v (2) m	9·2
10	3308	90	Bh	5−6, 7+10	8·8
10	3308	22	Ni	1 (2) v (4) 7	9·1
10	3308	62	Wf	5−7, 7+6	9·0*b*
11	3309	30	Co	5−5	8·7*b*
13	3311	50	Ma	=5	8·2
13	3311	30	Co	5 (1) v (3) 7	8·6
15	3313	,,	,,	5 (1) v (2) 7	8·7
15	3313	90	Bh	5−7, 7+9	8·9
15	3313	30	Bn	B (5) v (1) m	9·3
16	3314	62	Wf	7+2	9·6
20	3318	50	Ma	5 (3) v (1) 7	9·4
20	3318	30	Co	7+3	9·5*b*
23	3321	62	Wf	=7	9·8
23	3321	45	Bh	5−10, 7+6	9·2
24	3322	50	Bn	m+1	9·3
24	3322	30	Co	7+2	9·6
26	3324	50	Ma	5 (5) v (1) 7	9·5
29	3327	30	Co	=7	9·8*b*
Oct.					
4	3332	90	Bh	=7	9·8*b*
6	3334	,,	,,	7−2, 12+7	10·0
6	3334	50	Bn	7 (1) v (1) 9	10·0
8	3336	62	Wf	=12	10·7
12	3340	50	Bn	9−2, 10+1	10·4
12	3340	30	Co	12−1·5	10·9
13	3341	94	Ni	=12	10·7
14	3342	30	Co	=13	11·0
14	3342	90	Bh	7−4, 12+5	10·2
14	3342	140	Bo	10 (1) v (2) 12	10·5
15	3343	62	Wf	=10	10·5
20	3348	90	Bh	7−8, 12+1	10·6
21	3349	94	Ni	12 (5) v (3) 14	11·2
22	3350	50	Bn	10 (3) v (1) 12	10·6
25	3353	94	Ni	12 (5) v (2·5) 14	11·2
25	3353	90	Bh	14+8	10·7*b*
28	3356	140	Bo	14 (1) v (3) 17	11·6
28	3356	50	Bn	=13	11·0
Nov.					
1	3360	90	Bh	14+5	11·0
1922 Nov.					
4	3363	90	Bh	12−5, 14+3	11·2
10	3369	62	Wf	14−3, 18+3	11·8
11	3370	94	Ni	14−0·5	11·5
14	3373	45	Bh	=14	11·5
15	3374	50	Bn	14 (2) v (1) 18	11·8
18	3377	,,	,,	14 (3) v (1) 18	11·9
19	3378	90	Bh	14−3, 18+3	11·8
24	3383	,,	,,	14−3, 18+3	11·8
24	3383	120	Bn	14 (3) v (1) 18	11·9
26	3385	94	Ni	20 (1) v (3) 23	12·3
27	3386	140	Bo	14 (3) v (2) 18	11·8*c*
Dec.					
6	3395	90	Bh	=18	12·0
11	3400	,,	,,	18−1	12·1
14	3403	94	Ni	=23	12·5
16	3405	90	Bh	18−2, 23+2	12·3
18	3407	,,	,,	18−3, 23+2	12·3
20	3409	140	Bo	18 (3) v (2) 23	12·3*b*
25	3414	90	Bh	18−5, =23	12·5
1923 Jan.					
4	3424	,,	,,	23−3, =26	12·8
8	3428	,,	,,	23−3	12·8
8	3428	94	Li	<30	<13·2
9	3429	,,	Ni	27 (3) v (1·5) 30	13·2
11	3431	150	Bh	26−2	13·0
13	3433	157	Wf	29−2	13·3
14	3434	150	Bh	23−6, 26−3	13·1
16	3436	94	Ni	27 (1) v (3) 30	13·1
20	3440	90	Bh	23−5	13·0
23	3443	157	Wf	23−6, =30	13·2
24	3444	50	Bn	29−2	13·3
27	3447	90	Bh	26−4	13·2
Feb.					
4	3455	120	Bn	29−1	13·2
6	3457	94	Li	<30	<13·2
6	3457	,,	Ni	27 (2) v (1) 30	13·2
7	3458	157	Wf	29−2	13·3
8	3459	90	Bh	23−5	13·0*b*
9	3460	140	Bo	27 (1) v (1) 29	13·1
13	3464	94	Ni	27−1·5	13·3
16	3467	90	Bh	26−4	13·2
25	3476	,,	,,	23−2, 26+1	12·7
Mar.					
2	3481	,,	,,	23−2, 26+1	12·7
5	3484	,,	,,	=23, =26	12·7*b*
6	3485	130	Ma	23 (1) v (2) 29	12·7
6	3485	120	Bn	23 (3) v (1) 29	13·0
12	3491	140	Bo	23 (3) v (2) 27	12·9*b*
13	3492	90	Bh	18−5, =23	12·5
15	3494	94	Ni	20 (3) v (1) 23	12·5*b*
17	3496	120	Bn	18 (3) v (1) 23	12·4
18	3497	140	Bo	18 (2) v (3) 23	12·2
21	3500	94	Ni	20 (4) v (2) 23	12·4
21	3500	90	Bh	=18	12·0
27	3506	,,	,,	14−3, 18+2	11·8
Apr.					
3	3513	94	Ni	14 (2) v (4) 20	11·7
4	3514	55	Bo	10 (4) v (2) 13	10·8
4	3514	30	Co	14+2	11·3
4	3514	50	Bn	13 (2) v (1) 14	11·3
6	3516	62	Wf	=13, 14+5	11·0
7	3517	94	Ni	12 (6) v (4) 14	11·2
8	3518	75	Bn	13 (3) v (1) 14	11·4
8	3518	90	Bh	7−5	10·3
9	3519	55	Bo	10 (2) v (4) 13	10·6
10	3520	62	Wf	7−7, =10	10·5
13	3523	90	Bh	7−2	10·0

Aug. 19, White.
Aug. 21, Reddish.
Sept. 26, Pale yellow.
Sept. 29, About.

(3825) R URSÆ MAJORIS—*continued.*

1923					
Apr					
13	3523	30	Bn	10 (1) v (4) 13	10·6
14	3524	,,	Co	7−4	10·2*b*
14	3524	,,	D	7 (3) v (2) 12, 12+4	10·3
15	3525	62	Wf	7−3, 12+5	10·1
15	3525	22	Ni	7 (2·5) v (3) 10	10·1
16	3526	90	Bh	5−15, 7+1	9·7
18	3528	55	Bo	7+3	9·5*b*
19	3529	30	Co	7+1	9·7
19	3529	,,	D	7−1	9·9
19	3529	34	Li	5 (6) v (4) 7	9·1
20	3530	30	Bn	m+1	9·3
20	3530	22	Ni	1 (6) v (1) 7	9·6
22	3532	45	Bh	5−6, 7+10	8·8
24	3534	30	Bn	B (3) v (1) m	9·2
26	3536	,,	,,	B (1) v (1) m	9·0
26	3536	,,	Co	5−5	8·7*b*
26	3536	34	Li	5 (1) v (9) 7	8·3
27	3537	30	D	5 (3) v (1) 7, 7+5	9·3
28	3538	55	Bo	5−3	8·5
May					
1	3541	90	Bh	5−2	8·4
2	3542	30	D	5 (2) v (1) 7, 7+5	9·2
3	3543	90	Bh	5+1	8·1
3	3543	55	Bo	3 (4) v (1) 5	8·1*b*
3	3543	90	Wh	=5	8·2
3	3543	30	Co	5−2	8·4
3	3543	,,	Bn	5 (1) v (2) B	8·3
4	3544	34	Li	=4	8·0
5	3545	22	Ni	5 (0·5) v (6) 1	8·2
6	3546	62	Wf	=4	8·0
9	3549	90	Bh	5+2	8·0
9	3549	79	Ma	=5	8·2
10	3550	30	D	=5	8·2
11	3551	,,	Co	5+1·5	8·0
12	3552	34	Li	=4	8·0
13	3553	30	D	=5	8·2
13	3553	90	Bh	5+2	8·0
16	3556	50	Bn	=4	8·0
17	3557	90	Bh	5+2	8·0
17	3557	55	Bo	3 (3) v (2) 5	8·0*b*
18	3558	22	Ni	=5	8·2
20	3560	62	Wf	=4, 5+2	8·0
21	3561	25	Bn	3 (3) v (1) 4	7·9
24	3564	30	D	3−3, 5+2	8·0
27	3567	,,	,,	f−1, 3+1	7·6
30	3570	90	Bh	5+3	7·9
June					
2	3573	,,	,,	5+3	7·9
3	3574	F	Wf	4−2, 5+1	8·1
4	3575	30	D	3−3, 5+2	8·0*b*
10	3581	,,	,,	5+1	8·2
11	3582	90	Wh	=5	8·2
11	3582	50	Bn	=5	8·2
18	3589	30	D	=5	8·2
21	3592	45	Bh	5+3	7·9*b*
23	3594	,,	,,	5+1	8·1*b*
23	3594	90	Wh	=5	8·2
23	3594	30	D	5−2	8·4*b*
26	3597	,,	,,	5−2	8·4
28	3599	62	Wf	5−2	8·4
29	3600	30	D	5−3, 1+4	8·4

May 9, Ma, About. Pale red.
May 24, 4[c].
June 2, Orange-yellow.
June 23, Bh, Yellow.

1923					
July					
4	3605	30	D	5−4, 1+3	8
4	3605	50	Ma	5−1	8
4	3605	25	Bn	5 (2) v (3) B	8
5	3606	90	Bh	5−4, 7+12	8
5	3606	22	Ni	5 (7) v (1) 1	8
6	3607	30	D	5−4, 1+2	8
8	3609	62	Wf	5 (4) v (6) 7	8
8	3609	30	D	5−4	8
11	3612	22	Ni	5 (6) v (1) 1	8
12	3613	30	D	5−5, 1+1	8
14	3615	90	Bh	5−8, 7+8	9
15	3616	62	Wf	7+4	9
17	3618	30	D	5 (2) v (1) 7, 7+5	9
20	3621	,,	,,	5 (3) v (2) 7, 7+6	9
21	3622	34	Li	5 (5) v (5) 7	9
22	3623	62	Wf	7 (1) v (3) 5, 7+4	9
24	3625	50	Bn	B (3) v (1) m	9
28	3629	,,	,,	m+1·5	9
Aug					
1	3633	22	Ni	1 (4·5) v (1·5) 7	9
1	3633	90	Bh	7+2	9
3	3635	,,	,,	=7	9
3	3635	50	Bn	m (2) v (1) 7	9
6	3638	62	Wf	7−1, 10+6	9
8	3640	50	Bn	7−0·5	9
9	3641	90	Bh	7−2	10
11	3643	30	D	7−5, 12+4	10
12	3644	62	Wf	9+2, 10+5	10
13	3645	50	Bn	7 (2) v (3) 9	10
15	3647	90	Bh	7−3, 10+4	10
18	3650	51	Ma	7 (1) v (1) 12, 10+1, 14+5	10
22	3654	70	D	7−4, 10+2	10
22	3754	55	Bo	7 (6) v (1) 10	10
22	3654	90	Bh	12+3, 14+10	10
26	3658	,,	,,	12+1, 14+7	10
29	3661	62	Wf	10−1, 13+6	10
30	3662	50	Bn	10 (2) v (1) 13	10
31	3663	90	Bh	12−2, 14+6	10
Sept					
1	3664	60	D	12−5, 14+4	11
2	3665	90	Bh	14+3	11
3	3666	94	Ni	12 (6) v (4) 14	11
5	3668	50	Ma	10 (3) v (1) 13, 10−3	10
5	3668	,,	Bn	12 (2) v (1) 13	10
6	3669	62	Wf	10−6, =13	11
6	3669	55	Bo	10 (2) v (1) 12	10
8	3671	90	Bh	14+1	11
8	3671	94	Ni	12 (6) v (2·5) 14	11
9	3672	50	Ma	=13	11
11	3674	120	Bn	13 (3) v (2) 14	11
11	3674	140	Bo	14 (1) v (4) 18	11
13	3676	90	Bh	=14	11
13	3676	62	Wf	=14, 18+5·5	11
15	3678	79	Ma	14+1, 18+7, 23+4	11
16	3679	120	Bn	=14	11
18	3681	60	D	14−3, 18+3	11
21	3684	90	Bh	=14	11
23	3686	79	Ma	14−2	11
26	3689	90	Bh	14−1	11
29	3692	120	Bn	14 (4) v (1) 18	11
29	3692	140	Bo	14 (4) v (2) 18	11
29	3692	150	Wf	14−4, 18+2	11
30	3693	60	D	18+0·5	12

Aug. 22, D, 5-in. OG.
Sept. 9, About.

(3825) R URSÆ MAJORIS—*continued.*

1923 Sept 30	3693	90	Bh	14−2, 18+3	11·7
Oct 4	3697	,,	,,	14−3, 18+2	11·8
4	3697	79	Ma	13+1, 18+4	11·3*b*
6	3699	94	Ni	14 (5) v (2) 23	12·2
6	3699	90	Bh	14−3, =18	11·9*b*
8	3701	150	Wf	18−3, 20−1, 23+4	12·3
9	3702	90	Bh	=18	12·0*b*
14	3707	120	Bn	18 (1) v (1) 23	12·3
19	3712	90	Bh	18−1	12·1*b*
25	3718	,,	,,	18−2	12·2
26	3719	94	Ni	14 (7) v (1) 23	12·4
28	3721	140	Bo	18 (3) v (2) 23	12·3
28	3721	150	Wf	=23, 27+5	12·6
Nov 3	3727	120	Bn	18 (3) v (1) 23	12·4
7	3731	90	Bh	18−3, =23	12·4*b*
9	3733	,,	,,	18−3, 23+1	12·4
10	3734	94	Ni	23 (3) v (1) 27	13·0
10	3734	60	D	<23	<12·5
10	3734	140	Bo	18 (2) v (3) 23	12·2
10	3734	120	Bn	18 (2) v (1) 23	12·4
16	3740	94	Ni	23 (3) v (2) 27	12·9
17	3741	90	Bh	14−10, 18−5, =23	12·5*b*
19	3743	,,	,,	23−1	12·6
19	3743	120	Bn	23−1	12·6
30	3754	90	Bh	23−2, 26+1	12·7
Dec 2	3756	,,	,,	23−2, =26	12·8
3	3757	120	Bn	18 (3) v (1) 23	12·4
5	3759	79	Ma	14−5, 18−2	12·1*b*
8	3762	90	Bh	23−1	12·6
9	3763	94	Ni	23 (2) v (3) 27	12·8
9	3763	140	Bo	18 (2) v (3) 23	12·2*b*
12	3766	150	Wf	18−3, 23+2	12·3
12	3766	90	Bh	23+1	12·4
18	3772	,,	,,	18−3, 23+2	12·3
24	3778	,,	,,	18−1	12·1*b*
28	3782	,,	,,	18−1	12·1
30	3784	94	Ni	23+1·5	12·4
1924 Jan 2	3787	120	Bn	18 (3) v (2) 23	12·3
3	3788	90	Bh	=18	12·0
4	3789	94	Ni	20 (2) v (2) 23	12·4
5	3790	90	Bh	18−1, 23+2	12·2
6	3791	,,	,,	=18	12·0
6	3791	140	Bo	18 (2) v (3) 23	12·2
6	3791	120	Bn	18 (1) v (2) 23	12·2
7	3792	90	Bh	18+1	11·9
11	3796	,,	,,	=18	12·0
12	3797	130	Bo	18 (1) v (4) 23	12·1
16	3801	94	Ni	=20	12·3*b*
16	3801	90	Bh	=18	12·0
17	3802	,,	,,	18+1	11·9
20	3805	,,	,,	18+2	11·8
23	3808	,,	,,	18+3	11·7
25	3810	,,	,,	14−1, 18+3	11·7
25	3810	94	Ni	14 (2) v (2) 20	11·9
25	3810	120	Bn	14 (5) v (2) 18	11·9
25	3810	130	Bo	15 (1) v (3) 17	11·6
29	3814	120	Bn	14 (2) v (3) 18	11·7
31	3816	55	Bo	13 (4) v (2) 14	11·3*b*
31	3816	90	Bh	14+4	11·1

Jan. 3, 16, Bh, Unsteady.
Jan. 16, Ni, About. Difficult.

1924 Feb 1	3817	60	D	14+1	11·4
1	3817	120	Bn	13 (3) v (1) 14	11·4
3	3819	79	Ma	14+4, 18+6	11·3*b*
4	3820	90	Bh	7−7, 14+10	10·5
8	3824	60	D	=12	10·7
8	3824	62	Wf	=7	9·8
9	3825	32	Ca	6 (4) v (2) 10	10·3
11	3827	90	Bh	7−2	10·0
12	3828	32	Ca	=7	9·8
14	3830	,,	,,	m (2) v (1) 7	9·7
14	3830	90	Bh	7+3	9·5
14	3830	60	D	5 (7) v (2) 10	10·0
14	3830	55	Bo	7+3	9·5
16	3832	25	Bn	B−6, m+2	9·2
17	3833	22	Ni	=l	8·8*b*
17	3833	32	Ca	=k	8·9
18	3834	45	Bh	5−6, 7+10	8·8
20	3836	25	Bn	B (3) v (2) m	9·1
21	3837	90	Bh	5+1	8·1
22	3838	32	Ca	5 (4) v (2) l	8·6
22	3838	22	Ni	l (1) v (7) m	8·9
23	3839	40	D	5 (1) v (2) 7, 5−5	8·7
24	3840	25	Bn	B (1) v (3) m	8·8
24	3840	90	Bh	5+3	7·9
25	3841	,,	Wh	5 (1) v (2) 7	8·7
26	3842	25	Bn	4 (3) v (1) 5	8·1
26	3842	90	Bh	5+3	7·9
27	3843	32	Ca	5 (2) v (4) l	8·4
28	3844	30	D	5 (1) v (5) 7, 5−2	8·4
Mar 1	3846	45	Bh	5+3	7·9
2	3847	50	Bn	3 (3) v (1) 4	7·9
3	3848	22	Ni	3 (1) v (2) 5	7·9
4	3849	40	D	3−4, 5+1	8·1
4	3849	50	Ma	=5	8·2
4	3849	90	Bh	5+3	7·9
7	3852	50	Bn	3 (1) v (1) 4	7·8
7	3852	90	Bh	5+3	7·9
8	3853	30	D	3−2, 5+3	7·9
8	3853	50	Ma	5+3·5	7·8
8	3853	55	Bo	3 (1) v (4) 5	7·8
9	3854	32	Ca	3 (1) v (4) 5	7·8
10	3855	90	Bh	5+3	7·9
10	3855	50	Bn	3 (1) v (1) 4	7·8
11	3856	,,	Ma	5+4	7·8
11	3856	30	D	=3	7·7
12	3857	22	Ni	3+2	7·5
12	3857	55	Bo	3 (1) v (4) 5	7·8
13	3858	50	Bn	3+1	7·6
15	3860	90	Bh	5+2	8·0
18	3863	32	Ca	d (3) v (1) e	7·0
19	3864	30	D	3+3	7·4*b*
19	3864	90	Bh	=5	8·2
19	3864	25	Bn	3+3	7·4
22	3867	90	Bh	5+1	8·1
26	3871	,,	,,	5+1	8·1
29	3874	,,	,,	5+1	8·1
29	3874	32	Ca	d (1) v (3) e	6·8
29	3874	25	Bn	3+4	7·3
30	3875	30	D	b (6) v (1) 3, 3+3	7·5
30	3875	22	Ni	d−8, 3+4, M+2	7·3

Feb. 17, Ni, About. Difficult.
Feb. 28, Mar. 4, D, 2^c.
Mar. 4, 8, Ma, Pale red.
Mar. 11, D, 3^c.
Mar. 30, D, 3^c. Ni, Difficult.

(3825) R URSÆ MAJORIS—*continued.*

1924					
Apr					
1	3877	25	Bn	3+4	7·3
4	3880	,,	,,	3+3	7·4
4	3880	30	D	b (5) v (1) 3, 3+4	7·4
4	3880	90	Bh	5+2	8·0
6	3882	,,	,,	5+2	8·0
6	3882	32	Ca	d (3) v (1) e	7·0
7	3883	F	Bo	3+2	7·5*b*
7	3883	,,	Wf	3+2, 4+3	7·6
9	3885	25	Bn	3+3	7·4
10	3886	30	D	b (6) v (1) 3, 3+3	7·5
11	3887	90	Bh	5+3	7·9
14	3890	32	Ca	=e	7·1
16	3892	30	D	3+2	7·5*b*
16	3892	45	Bh	5+3	7·9
17	3893	22	Ni	5−1	8·3
20	3896	45	Bh	5+2	8·0
20	3896	25	Bn	3+1	7·6
24	3900	F	Wf	4−2, =5	8·2
24	3900	32	Ca	=5	8·2
25	3901	30	D	5−1	8·3*b*
25	3901	90	Bh	=5	8·2
27	3903	22	Ni	5 (2) v (2) 1	8·5
May					
1	3907	50	Bn	5−1	8·3
3	3909	90	Bh	5−3	8·5
4	3910	60	D	5 (1) v (3) 7, 5−4	8·6
5	3911	50	Ma	5+1	8·1
5	3911	62	Wf	5 (5) v (5) 7	9·0
5	3911	90	Bh	5−4	8·6
7	3913	22	Ni	=1	8·8
7	3913	25	Bn	5 (3) v (2) B	8·4
7	3913	60	D	5 (1) v (2) 7, 5−4	8·7
9	3915	,,	,,	5 (3) v (2) 7	9·1
11	3917	62	Wf	5−7, 7+6	9·0
13	3919	60	D	5 (3) v (1) 7, 7+4	9·4
13	3919	90	Bh	5−6, 7+10	8·8
16	3922	32	Ca	k (1) v (4) m	9·0
16	3922	25	Bn	B (3) v (1) m	9·2
21	3927	60	D	5 (6) v (1) 7, 7+2	9·5
22	3928	90	Bh	5 (1) v (1) 7	9·0
23	3929	62	Wf	=7	9·8
24	3930	60	D	7+1	9·7
24	3930	22	Ni	m (2) v (3) 10	9·8
25	3931	50	Ma	5 (4) v (1) 7	9·4
26	3932	90	Bh	5 (2) v (1) 7	9·2
26	3932	60	D	7+2	9·6
27	3933	50	Bn	m (1) v (2) 7	9·5
28	3934	32	Ca	m (1) v (2) 7	9·5
29	3935	62	Wf	7−1, 10+6	9·9
30	3936	60	D	7+2	9·6
June					
1	3938	,,	,,	7+1	9·7
2	3939	50	Ma	7+2	9·6
5	3942	60	D	7−3, 9+2	10·1
7	3944	62	Wf	12+2	10·5*b*
8	3945	22	Ni	=10	10·5*b*
10	3947	90	Bh	7 (1) v (3) 12	10·0
11	3948	60	D	7 (3) v (2) 12, 12+4	10·3
14	3951	90	Bh	7 (1) v (2) 12	10·1
18	3955	,,	,,	7 (1) v (1) 12	10·2
20	3957	50	Bn	9 (3) v (2) 10	10·4
21	3958	60	D	12−1	10·8
1924					
June					
22	3959	62	Wf	=12	10·
24	3961	79	Ma	12−1	10·
26	3963	62	Wf	=10, 13+5	10·
26	3963	60	D	12−3, 14+5	11·
28	3965	90	Bh	=10	10·
29	3966	60	D	12−5, 14+3	11·
30	3967	62	Wf	10−4, 14+6	10·
30	3967	90	Bh	10−2	10·
July					
4	3971	,,	,,	10−3	10·
4	3971	79	Ma	14+3·5	11·
6	3973	94	Ni	12 (5) v (4) 14	11·
6	3973	150	Wf	=13, 14+3	11·
6	3973	60	D	12−6, 14+1, 12 (4) v (1) 14	11·
9	3976	,,	,,	12−6, 14+2	11·
9	3976	90	Bh	=12	10·
10	3977	62	Wf	10−4, 13+1	10·
11	3978	50	Bn	12 (3) v (1) 13	10·
11	3978	94	Ni	12 (6) v (2·5) 14	11·
11	3978	79	Ma	=13	11·
19	3986	,,	,,	14−1	11·
19	3986	90	Bh	12 (2) v (1) 14	11·
19	3986	,,	Wh	=14	11·
20	3987	62	Wf	11−5, 14+1	11·
21	3988	120	Bn	13−2·5, 14+2	11·
24	3991	79	Ma	14+1	11·
24	3991	62	Wf	=14, 16+2·5	11·
24	3991	90	Bh	14+1	11·
29	3996	,,	,,	14−1	11·
29	3996	120	Bn	14 (3) v (2) 18	11·
30	3997	79	Ma	14 1	11·
30	3997	150	Wf	14−1, 18+4	11·
30	3997	94	Ni	14 (3) v (3) 24	11·
Aug					
2	4000	90	Bh	14−2	11·
2	4000	120	Bn	14 (2) v (1) 18	11·
2	4000	90	Wh	18 (1) v (1) 23	12·
5	4003	62	Wf	18−0·5, 20+1	12·
7	4005	120	Bn	14 (3) v (1) 18	11·
7	4005	79	Ma	14−2, 18+5	11·
8	4006	90	Bh	14−4, 18+1	11·
10	4008	120	D	18−3, 23+3	12·
15	4013	90	Bh	18−1	12·
18	4016	130	Ma	17−1, 18+2, 23+6	11·
19	4017	120	Bn	18 (1) v (2) 23	12·
22	4020	157	Wf	20−3, 26+2	12·
22	4020	90	Bh	18−2	12·
25	4023	,,	,,	18−2	12·
27	4025	157	Wf	18−7, =23, 27+3	12·
Sept					
2	4031	90	Bh	18−3	12·
3	4032	,,	Wh	18 (2) v (1) 23	12·
3	4032	157	Wf	23−2, 27+2	12·
10	4039	,,	,,	=23	12·
12	4041	90	Bh	=23	12·
16	4045	,,	,,	18−5, 23−2	12·
22	4051	120	D	18−3	12·
22	4051	,,	Bn	18 (2) v (1) 23	12·
26	4055	157	Wf	18−7, 23+1, 27+3	12·
26	4055	90	Bh	=23	12·
27	4056	120	Bn	18 (1) v (1) 23	12·
29	4058	90	Bh	18−4, 23+1	12·
Oct					
1	4060	,,	,,	18 (2) v (1) 23	12·
1	4060	,,	Wh	=23	12·
5	4064	157	Wf	18−3, 23+3	12·
11	4070	90	Bh	18−1	12·

April 4, D, 3^{c}.
May 7, 30, D, 5^{c}.
May 26, D, 4^{c}.
June 8, About. Difficult.

(3825) R URSÆ MAJORIS—*continued.*

1924 Oct					
15	4074	90	Bh	=18	12·0
16	4075	62	Wf	14−3, 18+1	11·9
19	4078	120	Bn	14 (3) v (1) 18	11·9
23	4082	,,	,,	14 (3) v (1) 18	11·9
23	4082	94	Ni	14 (3) v (1) 20	12·1
23	4082	,,	Li	14 (5) v (5) 18	11·8*b*
23	4082	90	Bh	18+2	11·8
26	4085	,,	,,	14 (2) v (1) 18	11·8
28	4087	,,	,,	14−2	11·7
29	4088	32	Ca	13 (4) v (1) 14	11·4
Nov					
3	4093	,,	,,	13 (2) v (3) 14	11·2
3	4093	120	Bn	14 (1) v (1) 18	11·8
3	4093	90	Bh	14−1	11·6
3	4093	193	Li	14 (2) v (8) 18	11·6*b*
4	4094	80	D	14+1	11·4*b*
4	4094	94	Ni	12 (6) v (1·5) 14	11·3
5	4095	90	Bh	14+1	11·4
8	4098	,,	,,	14+1	11·4
10	4100	,,	,,	14+1	11·4
15	4105	,,	,,	14+3	11·2
16	4106	94	Ni	12 (5) v (3·5) 14	11·2
16	4106	50	Bn	10 (5) v (1) 13	10·9
17	4107	34	Li	12 (5) v (5) 13	10·9
19	4109	90	Bh	12 (1) v (2) 14	11·0
22	4112	32	Ca	10*(2) v (3) 13	10·7
24	4114	90	Bh	=10	10·5
25	4115	22	Ni	=12	10·7
27	4117	50	Bn	9 (2) v (1) 10	10·4
Nov					
27	4117	90	Bh	7 (2) v (1) 10	10·2
29	4119	,,	,,	7 (1) v (2) 10	10·0
30	4120	60	D	7 (4) v (1) 12, 12+2	10·5
30	4120	50	Bn	7 (3) v (1) 9	10·1
Dec					
1	4121	90	Bh	7+2	9·6
2	4122	45	,,	5 (1) v (1) 7	9·0*b*
3	4123	32	Ca	m (2) v (2) 7	9·6
4	4124	45	Bh	5 (1) v (4) 7	8·5
5	4125	90	,,	=5	8·2
5	4125	50	Bn	m+2	9·2
6	4126	,,	,,	B−5, m+3	9·1
8	4128	30	D	5−5, 1+1	8·7
9	4129	25	Bn	B (1) v (7) m	8·7
9	4129	34	Li	5 (1) v (9) 7	8·3*b*
9	4129	90	Bh	2 (5) v (1) 5	7·8
12	4132	45	,,	2 (4) v (1) 5	7·7
14	4134	,,	,,	2 (4) v (1) 5	7·7
14	4134	90	Wh	=5	8·2
14	4134	25	Bn	3 (3) v (1) 4	7·9
15	4135	34	Li	2 (9) v (1) 3	7·5*b*
19	4139	45	Bh	2 (3) v (1) 5, =3	7·7
20	4140	32	Ca	d (3) v (1) e	7·0
22	4142	60	D	b (3) v (1) 3, 3+4	7·3
23	4143	22	Ni	3+4	7·3
24	4144	45	Bh	=3	7·7
25	4145	30	D	b (3) v (1) 3, 3+5	7·3
26	4146	25	Bn	3+3	7·4
30	4150	,,	,,	d−5, 3+5	7·2
31	4151	45	Bh	2 (3) v (1) 5	7·6*b*

Oct. 23, Ni, Unsteady.
Oct. 23, Nov. 3, Li, Difficult.
Nov. 4, D, About.

Dec. 22, 6^c.
Dec. 25, 4^c.

(4557) S URSÆ MAJORIS. (V. 2.)

H.D. 123961.

Date.	Julian Date.	Inst.	Observer.	Comparisons.	Deduced Mag.
1920 Jan					
1	2325	23	Bo	<22	<11·1
1	2325	45	Br	19−3	11·2
9	2333	94	Ni	=26	11·6*b*
9	2333	55	Bo	=24	11·7
13	2337	45	Br	22−3, 26+2	11·4
14	2338	55	Bo	=25	11·8
16	2340	75	Bn	22−5, =26	11·6*b*
16	2340	80	AB	26−3	11·9*b*
19	2343	85	Bn	26−1	11·7
21	2345	120	,,	26 (2) v (1) 28	11·8
21	2345	55	Bo	27 (1) v (3) 29	11·9
22	2346	80	AB	26−2	11·8*b*
23	2347	60	D	28−3, 30+3	12·2
24	2348	120	Bn	26 (3) v (1) 28	11·9
25	2349	80	AB	26−3	11·9*b*
26	2350	160	Br	=26	11·6
1920 Jan					
26	2350	55	Bo	=24	11·7*b*
31	2355	120	Bn	23 (4) v (1) 26	11·6
Feb					
1	2356	55	Bo	23 (1) v (3) 24	11·5
2	2357	94	Ni	=23	11·4
6	2361	,,	,,	22 (4) v (3) 23	11·3
6	2361	55	Bo	22 (1) v (3) 24	11·2
7	2362	160	Br	26+1	11·5
8	2363	80	AB	22−3, 26+2	11·4*b*
8	2363	120	Bn	23 (1) v (1) 26	11·5
11	2366	55	Bo	22 (1) v (3) 23	11·2
13	2368	80	AB	22−1, 26+5	11·1
15	2370	94	Ni	16 (7) v (1·5) 22	11·0
15	2370	55	Bo	20 (3) v (1) 22	11·1
17	2372	120	Bn	19 (1) v (1) 22	11·0
17	2372	40	Hw	16 (5) v (5) 19	10·8

(4557) S URSÆ MAJORIS—*continued.*

1920					
Feb					
18	2373	60	D	16−2, 22+2	10·9
18	2373	80	AB	16−2, 22+2	10·9
19	2374	55	Bo	20 (1) v (3) 22	11·0
19	2374	70	Ma	13 (1) v (3) 16	10·2
19	2374	94	Ni	16 (3·5) v (3) 22	10·9
21	2376	45	Br	13−3, 19+3	10·5
22	2377	55	Bo	13 (3) v (1) 16	10·5
24	2379	40	Hw	16 (5) v (5) 19	10·8*b*
24	2379	50	Ma	13 (1) v (1) 16	10·4*b*
24	2379	94	Ni	13 (4·5) v (2·5) 16	10·4
28	2383	55	Bo	9 (1) v (3) 10	9·8
29	2384	80	AB	h−3, 14+2	9·8
Mar					
1	2385	94	Ni	8 (10) v (1) 9	9·7
2	2386	50	Bn	h (1) v (2) 9	9·4
3	2387	55	Bo	8 (1) v (2) 9	9·1
3	2387	80	AB	h−2, 14+5	9·6*b*
6	2390	,,	,,	=h	9·2*c*
7	2391	45	Br	8−1	8·9
7	2391	50	Bn	h (4) v (3) 9	9·5
8	2392	55	Bo	8 (1) v (3) 9	9·1
8	2392	70	Ma	13+5	9·6
11	2395	50	,,	8−5, 13+4	9·5
12	2396	40	Hw	=8	8·8
12	2396	50	Bn	8 (2) v (1) h	9·1
12	2396	55	Bo	6 (1) v (2) 8	8·6
15	2399	30	D	8−3, h+1	9·1
15	2399	50	Ma	8−2·5	9·1
15	2399	22	Ni	8 (4) v (3) 9	9·4
16	2400	55	Bo	6 (3) v (1) 8	8·7
16	2400	80	AB	8−3, h+3·5	9·0*b*
18	2402	45	Br	6−2, 8+1	8·7
18	2402	50	Bn	6 (3) v (1) 8	8·7
19	2403	30	D	8−2, h+1	9·0
19	2403	55	Bo	6 (1) v (3) 8	8·6
19	2403	80	AB	8−1	8·9
20	2404	,,	,,	8−2, h+3	9·0
20	2404	50	Ma	8+1	8·7
21	2405	30	D	8−2, h+4	8·9
22	2406	40	Hw	=6	8·5
22	2406	80	AB	=8, h+4	8·8
25	2409	55	Bo	=8	8·8
26	2410	80	AB	6−2, 8+1	8·7*b*
27	2411	25	,,	6−3, 8+1	8·8*b*
28	2412	22	Ni	8 (1) v (6) 9	9·0*b*
30	2414	55	Bo	5 (9) v (1) 6	8·4
31	2415	50	Bn	6+2	8·3*b*
Apr					
6	2421	30	D	=6	8·5
6	2421	23	Bo	5 (9) v (1) 6	8·4
6	2421	25	AB	6−0·5, 8+3	8·5
11	2426	,,	,,	=6	8·5
12	2427	30	Bn	e (3) v (2) 6	8·2
13	2428	,,	D	5 (4) v (1) 6, 6+3	8·2
15	2430	23	Bo	5 (1) v (1) 6	7·9
16	2431	22	Ni	6 (3) v (1) 8	8·7
17	2432	45	Br	6+2	8·3
20	2435	25	AB	6+3	8·2*b*
21	2436	30	Bn	e (1) v (2) 6	8·1
21	2436	,,	D	5 (3) v (1) 6, 6+3	8·2
22	2437	25	AB	6+3	8·2
27	2442	30	Bn	e (2) v (3) 6	8·1
27	2442	45	Br	3−6, 6+3	8·2

Mar. 1, With 22, 9·7.
Mar. 15, Ma, Doubtful.
Mar. 19, Bo, With 23, 8·6.

1920					
Apr					
30	2445	25	AB	6+3·5	
May					
3	2448	30	Bn	5 (5) v (1) e	
4	2449	22	Ni	6 (8) v (1) 8	
7	2452	30	D	5 (3) v (1) 6, 6+3	
7	2452	25	AB	6+3	
9	2454	,,	,,	6+2	
9	2454	45	Br	6+4	
9	2454	30	Bn	e+1	
12	2457	22	Ni	=6	
12	2457	30	D	5 (4) v (1) 6, 6+4	
13	2458	,,	Bn	e (1) v (4) 6	
15	2460	F	AB	6+2	
19	2464	30	Bn	e (1) v (3) 6	
21	2466	,,	D	5 (3) v (1) 6, 6+4	
21	2466	22	Ni	6 (1) v (3) 8	
22	2467	45	Br	3−5, 6+5	
23	2468	30	Bn	e (1) v (2) 6	
25	2470	,,	D	5 (2) v (1) 6, 6+4	
26	2471	25	AB	=6, 8+3	
29	2474	30	Bn	e (2) v (1) 6	
30	2475	25	AB	6+2	
June					
5	2481	30	Bn	e (7) v (2) 6	
5	2481	45	Br	3−6, 6+4	
6	2482	25	AB	=6	
8	2484	22	Ni	6 (2) v (1) 8	
8	2484	30	D	5 (4) v (1) 6, 6+3	
9	2485	50	Bn	6+1	
10	2486	30	D	6+2	
12	2488	,,	,,	=6	
15	2491	,,	,,	6−1, 8+2	
19	2495	,,	,,	6−2, 8+1	
19	2495	45	Br	6+1	
19	2495	50	Bn	6 (1) v (1) 8	
19	2495	25	AB	8−3, h+1·5	
20	2496	,,	,,	8−2, h+2	
22	2498	,,	,,	8−3, h+1	
22	2498	30	D	6−3, 8+1	
29	2505	45	Br	6+1	
30	2506	30	D	8−2, h+2	
July					
8	2514	,,	,,	h−3, 9+2	
8	2514	94	Ni	8 (5) v (3) 9	
9	2515	22	,,	8 (6) v (1) 9	
9	2515	30	D	h−4, 9+1·5	
10	2516	80	AB	h−4, 14+4	
13	2519	,,	,,	h−4, 14+3	
14	2520	22	Ni	=9	
15	2521	50	Bn	h (2) v (1) 9	
16	2522	30	D	9−1, 13+3	
16	2522	80	AB	h−5, 14+3	
17	2523	45	Br	8−4, 13+6	
18	2524	30	D	9−3, 13+2	
18	2524	50	Ma	13+1	
19	2525	94	Ni	9+1	
20	2526	80	AB	14+2	
24	2530	50	Bn	12 (1) v (1) 14	
24	2530	,,	Ma	13 (1) v (1) 16	
27	2533	94	Ni	9 (4) v (2·5) 13	
30	2536	160	Br	13−5, 19+3	
Aug					
1	2538	79	Ma	13 (3) v (2) 16	
2	2539	80	AB	14−2·5, 16+2·5	

June 30, Difficult.
July 19, With 22, 9·9.

(4557) S URSÆ MAJORIS—*continued.*

1920 Aug.					
3	2540	94	Ni	13 (3) v (3) 16	10·4
5	2542	79	Ma	=16	10·7
6	2543	80	AB	16−1, 19+1·5	10·8
7	2544	50	Ma	16 (1) v (1) 22	10·9
8	2545	80	AB	16−1·5, =19	10·9
9	2546	75	Bn	14 (5) v (2) 19	10·7
15	2552	50	Ma	22−0·5	11·1
15	2552	25	AB	19−1	11·0
16	2553	60	D	16−3, 22+1	11·0
17	2554	55	Bo	22 (1) v (3) 23	11·2
19	2556	75	Bn	22 (1) v (2) 23	11·2
22	2559	,,	,,	22 (3) v (2) 23	11·3
22	2559	50	Ma	=22	11·1
23	2560	80	AB	19−3·5	11·3*c*
31	2568	25	,,	<(19−2)	<11·1*c*
Sept.					
4	2572	79	Ma	22−2, =23	11·4
6	2574	,,	,,	16 (6) v (1) 27	11·7
7	2575	75	Bn	23−2	11·6*b*
8	2576	55	Bo	26 (1) v (3) 28	11·7
9	2577	94	Ni	22 (3) v (2) 23	11·3
10	2578	160	Br	19−1	11·0
10	2578	85	Bn	23 (1) v (1) 26	11·5*b*
12	2580	75	,,	23 (1) v (2) 26	11·5
12	2580	60	D	22−4, 26+2	11·4*b*
12	2580	80	AB	26−1, 28+2	11·7
13	2581	79	Ma	16 (4) v (1) 26	11·4
14	2582	55	Bo	23 (3) v (1) 24	11·6
16	2584	94	Ni	22 (5) v (2) 23	11·3
18	2586	95	Bn	22 (1) v (2) 23	11·2
19	2587	55	Bo	23 (1) v (3) 24	11·5
19	2587	80	AB	22−5, =26	11·6
25	2593	160	Br	19+2	10·7
29	2597	55	Bo	13 (1) v (1) 14	10·2*b*
Oct.					
1	2599	94	Ni	9 (1) v (1) 13	9·9
2	2600	50	Bn	14+1	10·2
3	2601	80	AB	=14, 16+3	10·3
4	2602	55	Bo	9 (1) v (1) 11	9·9
6	2604	50	Ma	13+2	9·9
8	2606	40	Hw	8 (2) v (8) 9	9·0
8	2606	22	Ni	8 (6) v (1·5) 9	9·6
9	2607	30	D	=9	9·7
9	2607	55	Bo	8 (3) v (1) 9	9·5*b*
10	2608	50	Bn	h (1) v (1) 9	9·5
14	2612	55	Bo	6 (3) v (1) 8	8·7
15	2613	80	AB	h−1, 9+3	9·4
18	2616	50	Bn	8 (2) v (1) h	9·1
18	2616	45	Br	=6	8·5
19	2617	55	Bo	6 (1) v (2) 8	8·6
19	2617	40	Hw	6 (5) v (5) 8	8·7*b*
19	2617	22	Ni	8 (3) v (4) 9	9·2
22	2620	80	AB	6−2, 8+1	8·7
23	2621	50	Bn	6 (1) v (2) 8	8·6
24	2622	22	Ni	6 (3) v (2) 8	8·7
26	2624	23	Bo	5 (7) v (1) 6	8·4
27	2625	50	Bn	6+1·5	8·4
28	2626	40	Hw	=6	8·5*b*
28	2626	80	AB	=6	8·5*b*
29	2627	,,	,,	6+1·5	8·4
29	2627	45	Br	6+4	8·1
30	2628	50	Bn	6+2	8·3
1920 Oct.					
31	2629	55	Bo	5 (3) v (1) 6	8·2
Nov.					
1	2630	22	Ni	3 (8) v (1) 6	8·4
4	2633	55	Bo	5 (3) v (1) 6	8·2
4	2633	30	Bn	e (3) v (2) 6	8·2
6	2635	80	AB	6+2·5	8·3
8	2637	55	Bo	5 (1) v (2) 6	7·7
10	2639	80	AB	6+3	8·2*b*
11	2640	25	Bn	e (1) v (1) 6	8·2
12	2641	40	Hw	5 (7) v (3) 6	8·1*b*
13	2642	,,	,,	5 (2) v (8) 6	7·5
16	2645	22	Ni	3 (6) v (1) 6	8·4
16	2645	30	D	6+1·5	8·4*b*
16	2645	55	Bo	5 (1) v (2) 6	7·7
18	2647	45	Br	3−6, 6+4	8·1
18	2647	80	AB	6+3	8·2
18	2647	30	D	5 (4) v (1) 6, 6+3	8·2
20	2649	40	Hw	5 (3) v (7) 6	7·7
20	2649	55	Bo	5 (1) v (3) 6	7·6
20	2649	30	Bn	e (1) v (2) 6	8·1
23	2652	25	,,	e (1) v (2) 6	8·1
Dec.					
1	2660	55	Bo	5 (1) v (3) 6	7·6
1	2660	45	Br	3−4, 6+6	7·9
4	2663	22	Ni	3 (7) v (2·5) 6	8·2
9	2668	30	Bn	e (1) v (3) 6	8·0
12	2671	55	Bo	5 (1) v (2) 6	7·7
21	2680	30	Bn	5 (2) v (1) 6, e−1	8·1
21	2680	40	Hw	5 (6) v (4) 6	8·0*b*
22	2681	22	Ni	3 (7) v (2·5) 6	8·2
22	2681	55	Bo	5 (1) v (3) 6	7·6
28	2687	40	Hw	5 (5) v (5) 6	7·9*b*
28	2687	30	Bn	e (1) v (3) 6	8·0
31	2690	45	Br	3−5, 6+5	8·0
1921 Jan.					
1	2691	25	AB	6+3	8·2
9	2699	22	Ni	6 (2) v (2) 8	8·7
9	2699	30	Bn	e (3) v (2) 6	8·2*b*
12	2702	,,	,,	e (2) v (1) 6	8·3
14	2704	55	Bo	5 (3) v (1) 6	8·2
14	2704	32	Ca	4−9, 6+1	8·4
15	2705	45	Br	6+2	8·3
15	2705	50	Ma	6 (1) v (1) 8	8·7
15	2705	40	Hw	=6	8·5*b*
15	2705	48	Wi	=6, 8+3	8·5
16	2706	22	Ni	6 (2) v (2) 8	8·7
16	2706	30	D	6−2, 8+1	8·7*b*
16	2706	80	AB	6+1	8·4
22	2712	22	Ni	6 (2) v (2) 8	8·7
27	2717	55	Bo	5 (7) v (1) 6	8·4
28	2718	50	Bn	6 (2) v (1) 8	8·7*b*
29	2719	80	AB	8−1, h+4	8·9
30	2720	30	D	=h	9·2
31	2721	80	AB	=8, h+4	8·8
31	2721	55	Bo	5 (7) v (1) 6	8·4
31	2721	32	Ca	8−1, 9+8	8·9
31	2721	48	Wi	8−3	9·1
Feb.					
1	2722	50	Bn	6 (2) v (1) 8	8·7
2	2723	40	Hw	=6	8·5
3	2724	80	AB	8−1, h+3	8·9
3	2724	45	Br	8−1	8·9

Aug. 5, Pale red.
Sept. 12, D, Difficult.
Sept. 25, About.
Oct. 1, With 22, 10·2.

Jan. 16, AB, With 25, 8·4.
Jan. 29, With 25, 8·9.
Jan. 31, AB, With 25, 8·8.

(4557) S URSÆ MAJORIS—*continued.*

1921 Feb					
3	2724	48	Wi	8−6	9·4
5	2726	55	Bo	6 (4) v (1) 8	8·8
5	2726	50	Ma	8−2, 13+5	9·3
9	2730	,,	,,	8−1	8·9
12	2733	22	Ni	8 (6) v (1·5) 9	9·6
12	2733	80	AB	8−3, h+1	9·1
13	2734	,,	,,	h−1	9·3*b*
14	2735	50	Bn	h (2) v (3) 9	9·4
14	2735	32	Ca	=10	9·9
14	2735	50	Ma	13+4, 14+3	9·8
15	2736	80	AB	h−1	9·3
17	2738	,,	,,	h−3	9·5
17	2738	45	Br	=9	9·7
19	2740	94	Ni	9+0·5	9·7
19	2740	55	Bo	8 (3) v (1) 9	9·5
20	2741	50	Bn	9−1	9·8
23	2744	80	AB	13+2	9·9
24	2745	25	,,	13−0·5	10·1
24	2745	55	Bo	9 (3) v (1) 10	9·9
24	2745	50	Bn	9 (1) v (2) 11	9·8
25	2746	25	AB	13−1	10·2*b*
26	2747	94	Ni	9 (4) v (1) 13	10·0
27	2748	50	Ma	13−2	10·3
28	2749	32	Ca	10−1, 13+1	10·0
Mar					
1	2750	50	Bn	11 (3) v (1) 14	10·2
1	2750	40	Hw	=19	10·9*b*
2	2751	48	Wi	19−1, 22+1	11·0
2	2751	55	Bo	11 (1) v (1) 12	10·0
3	2752	80	AB	13−3, 16+3	10·4
7	2756	50	Bn	12 (2) v (1) 14	10·2
7	2756	40	Hw	16 (5) v (5) 19	10·8
8	2757	25	AB	16−1, 19+2	10·7
10	2759	48	Wi	13−3, 16+3	10·4*b*
10	2759	94	Ni	16 (3) v (3) 22	10·9
10	2759	45	Br	13−4, 19+4	10·5
10	2759	40	Hw	=19	10·9
10	2759	50	Bn	14+0·5	10·2
10	2759	55	Bo	=15	10·4
11	2760	80	AB	16−2, 19+2	10·8
14	2763	32	Ca	15−2, 16+1	10·6
15	2764	55	Bo	15 (3) v (1) 16	10·6
18	2767	50	Bn	19−0·5	11·0
19	2768	80	AB	=22	11·1*b*
20	2769	160	Br	=19	10·9
21	2770	55	Bo	14 (3) v (1) 15	10·3*b*
24	2773	90	Hw	16 (5) v (5) 26	11·1
24	2773	94	Ni	16 (2) v (2) 22	10·9
25	2774	120	Bn	22−0·5	11·1
26	2775	48	Wi	=22, 26+5	11·1
26	2775	32	Ca	17−2, 19+1	10·8
29	2778	94	Ni	22 (4) v (2) 23	11·3
30	2779	48	Wi	22−2	11·3
30	2779	90	Hw	16 (5) v (5) 26	11·1*b*
30	2779	120	Bn	22 (3) v (1) 23	11·4
30	2779	55	Bo	22 (1) v (3) 23	11·2
Apr					
1	2781	80	AB	22−3	11·4*b*
2	2782	55	Bo	22 (1) v (3) 23	11·2
2	2782	160	Br	22−1	11·2
3	2783	80	Ca	21−2, 24+2	11·4
4	2784	120	Bn	23 (1) v (1) 26	11·5
6	2786	94	Ni	22 (3) v (2) 23	11·3
7	2787	55	Bo	22 (1) v (1) 23	11·3
1921 Apr					
7	2787	120	Bn	23 (1) v (1) 26	11·
7	2787	48	Wi	16−4, 26+5	11·
8	2788	80	AB	26+1	11·
10	2790	48	Wi	16−4, 26+6	11·
12	2792	55	Bo	23 (1) v (3) 24	11·
15	2795	160	Br	19−4, 26+2	11·
18	2798	55	Bo	23 (3) v (1) 24	11·
23	2803	120	Bn	22 (3) v (1) 23	11·
27	2807	94	Ni	23−1	11·
27	2807	120	Bn	23 (1) v (1) 26	11·
28	2808	55	Bo	22 (3) v (1) 23	11·
29	2809	25	AB	26+2	11·
29	2809	160	Br	19−2	11·
29	2809	120	Bn	23 (1) v (2) 26	11·
May					
6	2816	80	Ca	17−2, 19+1	10·
6	2816	25	AB	22−3, 21+1	11·
8	2818	50	Bn	19 (1) v (2) 22	11·
8	2818	48	Wi	=16, 22+4	10·
10	2820	55	Bo	16 (1) v (1) 18	10·
11	2821	94	Ni	13 (3) v (2) 16	10·
16	2826	60	D	16+2	10·
19	2829	50	Bn	h (3) v (2) 9	9·
20	2830	55	Bo	8 (2) v (1) 9	9·
22	2832	50	Bn	h (1) v (3) 14	9·
24	2834	94	Ni	8 (5) v (4) 9	9·
28	2838	48	Wi	=8	8·
29	2839	22	Ni	8 (2) v (4) 9	9·
29	2839	30	D	8−1, h+4	8·
29	2839	32	Ca	8−2, 9+7	9·
31	2841	80	AB	8−1, h+3	8·
June					
1	2842	22	Ni	6 (4) v (1) 8	8·
1	2842	55	Bo	6 (1) v (2) 8	8·
2	2843	45	Br	6+1	8·
5	2846	30	D	6+1	8·
6	2847	48	Wi	6−1, 8+2	8·
6	2847	50	Bn	6+1·5	8·
9	2850	48	Wi	6+3, 8+6	8·
11	2852	30	Bn	e (2) v (1) 6	8·
11	2852	50	Ma	6+2	8·
14	2855	55	Bo	5 (3) v (1) 6	8·
16	2857	30	D	6+1	8·
17	2858	,,	Bn	e (2) v (1) 6	8·
23	2864	,,	,,	e (1) v (1) 6	8·
24	2865	80	AB	6−2, 8+1	8·
24	2865	30	D	6+2·5	8·
24	2865	22	Ni	6 (0·5) v (3) 8	8·
28	2869	32	Ca	4−7, 6+2	8·
28	2869	30	Bn	e (3) v (1) 6	8·
29	2870	45	Br	3−6, 6+4	8·
July					
1	2872	F	AB	6+2	8·
4	2875	30	D	5 (5) v (1) 6, 6+2·5	8·
4	2875	22	Ni	3 (6) v (1·5) 6	8·
5	2876	30	Bn	e (2) v (1) 6	8·
5	2876	50	Ma	2 (1) v (1) 6	7·8
8	2879	30	Bn	e (3) v (1) 6	8·
9	2880	25	AB	=6, 8+3	8·
9	2880	30	D	6+2	8·
9	2880	22	Ni	3 (7) v (1) 6	8·

Mar. 11, With 25, 10·8.
April 4, Bn, t.

April 7, 23, Bn, t.
May 16, Difficult.
May 24, With 22, 9·4.
May 31, With 25, 8·9.
June 24, AB, With 25, 8·7.

(4557) S URSÆ MAJORIS—*continued.*

1921					
July					
9	2880	48	Wi	6+1, 8+4	8·4
12	2883	30	Bn	e (4) v (1) 6	8·4
13	2884	,,	D	5 (4) v (1) 6, 6+3	8·2
20	2891	50	Bn	6+2	8·3
21	2892	,,	Ma	6 (2) v (1) 8	8·7
22	2893	32	Ca	4−7, 6+4	8·2*b*
22	2893	25	AB	6+3	8·2
25	2896	,,	,,	6+3	8·2
25	2896	50	Bn	6+2	8·3
25	2896	30	D	5 (5) v (1) 6, 6+2	8·3*b*
25	2896	48	Wi	5−6, 6+6	7·9
27	2898	25	AB	6+3	8·2
31	2902	,,	,,	6+4	8·1
31	2902	30	D	5 (4) v (1) 6, 6+3	8·2
Aug					
3	2905	50	Ma	6+1, 8+2·5	8·5
4	2906	25	AB	6+4	8·1
5	2907	32	Ca	4−8, 6+2	8·3
6	2908	25	AB	6+4	8·1
8	2910	30	Bn	5−5, e+1	7·8
9	2911	50	Ma	2 (3) v (1) 6	8·1*b*
13	2915	,,	,,	6+2	8·3*b*
18	2920	22	Ni	3 (6) v (2) 6	8·3
18	2920	55	Bo	5 (1) v (3) 6	7·6
21	2923	30	D	5 (4) v (1) 6, 6+3	8·2*b*
21	2923	22	Ni	3 (6) v (2) 6	8·3
24	2926	55	Bo	5 (1) v (2) 6	7·7
25	2927	30	Bn	6+2	8·3*b*
25	2927	50	Ma	2 (3) v (1) 6	8·1
26	2928	22	Ni	3 (7) v (1) 6	8·4
26	2928	30	D	6+1	8·4
27	2929	25	AB	=6, 8+3	8·5
29	2931	50	Ma	6+4	8·1
30	2932	25	AB	6+1	8·4
30	3932	45	Br	6+3	8·2
31	2933	55	Bo	5 (5) v (1) 6	8·3*b*
Sept					
2	2935	75	Bn	6+1	8·4
3	2936	50	Ma	6+2	8·3
4	2937	32	Ca	4−9, 6+1	8·4
4	2937	30	D	6−1, 8+2	8·6
5	2938	55	Bo	5 (5) v (1) 6	8·3
5	2938	48	Wi	6+2, 8+5	8·3
5	2938	75	Bn	6+1	8·4
6	2939	22	Ni	6 (2) v (1) 8	8·7
6	2939	25	AB	6−2, 8+1	8·7
7	2940	75	Bn	=6	8·5
7	2940	48	Wi	=6, 8+3	8·5
8	2941	,,	,,	6+2, 8+4	8·4
8	2941	40	Hw	v (5) 6 (5) 8	8·2*b*
10	2943	45	Br	6+2	8·3
10	2943	75	Bn	6 (2) v (1) 8	8·7
15	2948	,,	,,	8+0·5	8·8
21	2954	,,	,,	8 (3) v (1) h	9·1
21	2954	55	Bo	6 (3) v (1) 8	8·7
21	2954	40	Hw	=6	8·5*b*
23	2956	30	D	8−4, h+1	9·2
23	2956	80	AB	8−4, =h	9·2
23	2956	22	Ni	8 (5) v (3) 9	9·4
24	2957	45	Br	8−2	9·0
25	2958	30	D	h−1, 9+3	9·4
26	2959	55	Bo	7 (3) v (2) 8	8·7
27	2960	40	Hw	8 (4) v (6) 9	9·2
1921					
Sept					
27	2960	50	Bn	h (1) v (3) 9	9·4
27	2960	80	AB	h−4·5, 13+3	9·7
30	2963	25	,,	h−4, 13+3	9·7
Oct					
1	2964	55	Bo	8 (1) v (1) 9	9·3
1	2964	50	Bn	h (5) v (1) 9	9·7
2	2965	48	Wi	13−2, 19+6	10·3
4	2967	50	Ma	8−2·5, =10	9·5
5	2968	,,	Bn	9+1	9·6
5	2968	80	AB	13−1, 16+5	10·2
6	2969	40	Hw	=9	9·7
6	2969	22	Ni	=9	9·7
6	2969	48	Wi	13−4, 16+2	10·5
7	2970	55	Bo	13 (1) v (1) 14	10·2
9	2972	48	Wi	19+5	10·4*b*
14	2977	160	Br	19+3	10·6
16	2979	55	Bo	13 (1) v (3) 14	10·1*b*
16	2979	95	Bn	14 (1) v (3) 19	10·4*b*
18	2981	90	Hw	=16	10·7*b*
23	2986	94	Ni	=22	11·1
23	2986	120	Bn	19+1	10·8
25	2988	160	Br	19−1, 22+1	11·0
30	2993	120	Bn	19 (2) v (1) 22	11·0
30	2993	140	Bo	22 (3) v (1) 23	11·4*b*
Nov					
6	3000	,,	,,	23 (1) v (1) 24	11·6
7	3001	160	Br	=22	11·1
7	3001	120	Bn	22−4, 23−1	11·5
10	3004	40	Hw	<19	<10·9
12	3006	120	Bn	22−4, 23−1	11·5*b*
19	3013	55	Bo	23 (1) v (1) 24	11·6*c*
22	3016	94	Ni	22 (4) v (1) 23	11·4
22	3016	80	AB	28−1	12·0*c*
22	3016	140	Bo	27 (1) v (2) 29	12·0*b*
23	3017	120	Bn	23−1	11·5
24	3018	140	Bo	24 (1) v (1) 27	11·8
24	3018	94	Ni	22 (4·5) v (1·5) 23	11·4
Dec					
2	3026	,,	,,	22 (6) v (1) 23	11·4
3	3027	160	Br	22−2, 26+2	11·3
17	3041	40	Hw	<19	<10·9*b*
17	3041	55	Bo	19 (1) v (1) 22	11·0
20	3044	50	Bn	19 (1) v (2) 22	11·0
20	3044	48	Wi	19−6	11·5*b*
21	3045	,,	,,	=22	11·1
23	3047	160	Br	19+2	10·7
25	3049	75	Bn	14+1	10·2
25	3049	94	Ni	13 (4) v (1) 16	10·5
26	3050	55	Bo	14 (1) v (2) 16	10·4
28	3052	94	Ni	9 (2) v (1) 13	10·0
28	3052	75	Bn	9 (3) v (1) 11	9·9
31	3055	,,	,,	9 (2) v (1) 10	9·8
1922					
Jan					
2	3057	...	Sa	6−10, 8−7, 9+2, 13+3, 16+10	9·6
3	3058	45	Br	=9	9·7
3	3058	30	Bn	h (2) v (1) 9	9·6
6	3061	94	Ni	8 (6) v (2) 9	9·5
6	3061	55	Bo	8 (6) v (3) 9	9·4
10	3065	60	Bn	8−3, =h	9·2
10	3065	48	Wi	7−6, 9+6	9·1
11	3066	,,	,,	7−4, 9+8	8·9

July 21, Sept. 3, Pale yellow.
Aug. 3, Pale orange.
Sept. 23, AB, With 25, 9·2.

Sept. 27, AB, With 25, 9·7.
Oct. 5, AB, With 25, 10·2.
Nov. 7, Br, About.

(4557) S URSÆ MAJORIS—*continued.*

1922					
Jan					
12	3067	55	Bo	8 (3) v (6) 9	9·1
16	3071	,,	,,	6 (3) v (1) 8	8·7
16	3071	30	Bn	8 (1) v (1) h	9·0*b*
19	3074	22	Ni	6 (4) v (0·5) 8	8·8
20	3075	40	Hw	=8	8·8
22	3077	45	Br	=8	8·8
30	3085	55	Bo	6+2	8·3
31	3086	48	Wi	8−1	8·9
Feb					
1	3087	,,	,,	=8	8·8
1	3087	25	Bn	e (4) v (1) 6	8·4
1	3087	40	Hw	v (5) 6 (5) 8	8·2
5	3091	55	Bo	6+3	8·2
8	3094	,,	,,	6+4	8·1*b*
9	3095	25	Bn	e (1) v (2) 6	8·1
10	3096	22	Ni	6 (2) v (1·5) 8	8·7
13	3099	25	Bn	e (1) v (2) 6	8·1
13	3099	40	Hw	=6	8·5*b*
14	3100	55	Bo	6+4	8·1*b*
17	3103	45	Br	6+3	8·2
17	3103	...	Sa	2−7, 5−4, 6+3, 8+6	8·0
17	3103	30	Bn	e (2) v (3) 6	8·1
18	3104	55	Bo	5 (6) v (6) 6	7·9
18	3104	32	Ca	=6	8·5
18	3104	48	Wi	6−2, 8+1	8·7
19	3105	50	Ma	=6	8·5
21	3107	...	Sa	2−10, 5−8, 6+4, 8+7	8·1
24	3110	25	Bn	e (1) v (2) 6	8·1
24	3110	50	Ma	6+1	8·4
25	3111	22	Ni	6 (1) v (4) 8	8·6
25	3111	55	Bo	5 (7) v (5) 6	8·0
26	3112	48	Wi	=6, 8+4	8·5
Mar					
2	3116	55	Bo	5 (7) v (5) 6	8·0
2	3116	30	Bn	e (1) v (3) 6	8·0
4	3118	45	Br	3−5, 6+5	8·0
4	3118	40	Hw	v (6) 6 (4) 8	8·0
4	3118	48	Wi	6−2, 8+1	8·7
4	3118	30	D	5 (5) v (1) 6, 6+3	8·3*b*
7	3121	,,	Bn	e+1	7·8
7	3121	48	Wi	6+3	8·2
8	3122	...	Sa	2−9, 5−8, 6+6, 8+10	7·9
8	3122	55	Bo	5−4	7·7
9	3123	32	Ca	4−7, 6+3	8·2
9	3123	48	Wi	6+3	8·2
10	3124	...	Sa	2−5, 5−5, 6+8, 8+12	7·7
12	3126	25	Bn	5 (4) v (1) e	7·7
16	3130	55	Bo	5−1	7·4*b*
19	3133	22	Ni	3 (8) v (2·5) 6	8·3
20	3134	50	Ma	6+2·5	8·3
20	3134	40	Hw	2 (5) v (5) 5	7·2
21	3135	32	Ca	4−7, 6+3	8·2
22	3136	45	Br	6+4	8·1
23	3137	55	Bo	5−2	7·5
25	3139	30	Bn	2 (3) v (2) e	7·5
28	3142	25	,,	5 (2) v (1) e, 3−2	7·7
31	3145	22	Ni	3 (6) v (3) 6	8·2
Apr					
1	3146	30	Bn	5 (1) v (1) e	7·6
4	3149	,,	,,	5 (2) v (1) e	7·7
4	3149	...	Sa	2−6, 5−6, 6+5, 8+8	7·9
5	3150	32	Ca	4−7, 6+3	8·2
14	3159	,,	,,	4−8, 6+2	8·3

1922					
Apr					
16	3161	55	Bo	6+3	8·
19	3164	30	Bn	e (3) v (2) 6	8·
19	3164	40	Hw	v (5) 6 (5) 8	8·
19	3164	22	Ni	=6	8·
19	3164	33	Wi	6−2, 8+1	8·
20	3165	55	Bo	6+4	8·
24	3169	30	Bn	e (2) v (1) 6	8·
25	3170	32	Ca	6−1, 8+3	8·
27	3172	30	Bn	=6	8·
29	3174	45	Br	6+1	8·
May					
1	3176	55	Bo	6 (2) v (1) 8	8·
2	3177	...	Sa	=6, 8+3	8·
4	3179	30	Bn	6 (4) v (1) 8	8·
5	3180	32	Ca	8−2, 9+7	9·
6	3181	33	Wi	=8	8·
7	3182	60	Kw	7 (1) v (3) 9, =8	8·
8	3183	,,	,,	8 (1) v (4) 9	9·
12	3187	44	Wi	8−5, 9+1	9·
13	3188	45	Br	8−8, 13+4	9·
13	3188	50	Bn	h (2) v (1) 9	9·
14	3189	55	Bo	8 (4) v (4) 9	9·
15	3190	60	Kw	10 (2) v (2) 11	9·
18	3193	32	Ca	9−1, 10+1	9·
19	3194	50	Bn	h (3) v (1) 9	9·
19	3194	...	Sa	8−8, 9+3, 13+2, 16+10	9·
19	3194	44	Wi	9+1, 14+5	9·
20	3195	50	Bo	9 (1) v (2) 12	9·
21	3196	22	Ni	9 (2) v (1) 13	10·
22	3197	62	D	9−5, 13+1	10·
23	3198	60	Kw	10 (2) v (2) 11	9·
24	3199	32	Ca	15−1, 16+2	10·
25	3200	45	Br	19+4	10·
27	3202	55	Bo	12 (1) v (1) 14	10·
27	3202	50	Bn	14+1	10·
27	3202	94	Ni	=16	10·
28	3203	60	Kw	=11	10·
June					
1	3207	22	Ni	13 (5) v (1) 16	10·
4	3210	50	Bn	14 (3) v (1) 19	10·
11	3217	60	Kw	13−2	10·
16	3222	55	Bo	22 (1) v (2) 23	11·
23	3229	80	Ca	23−1, 24+1	11·
28	3234	79	Ma	22−2·5	11·
July					
10	3246	160	Br	22−1	11·
11	3247	...	Sa	=28	11·
12	3248	22	Ni	23 (3) v (2) 26	11·
18	3254	120	Bn	23 (1) v (1) 26	11·
18	3254	50	Ma	19−2, 22−2	11·
19	3255	55	Bo	23 (1) v (2) 24	11·
21	3257	160	Br	19−1, =22	11·
28	3264	120	Bn	19 (1) v (3) 22	11·
31	3267	140	Bo	14 (1) v (3) 16	10·
31	3267	50	Ma	16 (1) v (3) 22	10·
Aug					
2	3269	160	Br	13−6, 19+2	10·
7	3274	94	Ni	8 (5) v (1) 9	9·
14	3281	32	Ca	8 (5) v (4) 9	9·
15	3282	75	Bn	h (4) v (1) 9	9·
15	3282	30	D	h−3, 9+2	9·
16	3283	55	Bo	6 (2) v (1) 8	8·
17	3284	50	Ma	8−2, 13+3	9·

May 27, Ni, With 22, 10·5.
Aug. 7, With 22, 9·6*b*.
Aug. 15, D, 3-in.

(4557) S URSÆ MAJORIS—*continued.*

1922					
Aug					
17	3284	22	Ni	8 (5·5) v (2·5) 9	9·4
20	3287	,,	,,	8 (5) v (3) 9	9·4
20	3287	55	Bo	6 (3) v (1) 8	8·7
20	3287	45	Br	8−2, 9+6	9·1
20	3287	30	Bn	h (1) v (1) 9	9·5
20	3287	37	Lp	8 (2) v (2) 9	9·3
23	3290	100	,,	7 (2) v (2) 9	9·1
23	3290	50	Ma	8+1, 13+3	9·3
23	3290	...	Sa	6−2, =8, 9+5, 16+15	9·0
25	3292	30	Bn	8 (3) v (1) h	9·1
27	3294	22	Ni	8 (3·5) v (2·5) 9	9·4
28	3295	32	Ca	8 (1) v (7) 9	8·9
31	3298	75	Bn	h (1) v (3) h	8·9
Sept					
7	3305	33	Wi	6−2, =8	8·8
7	3305	13	Bo	8−3	9·1*b*
9	3307	30	Bn	6 (5) v (2) 8	8·7
9	3307	37	Lp	=8	8·8*b*
10	3308	22	Ni	8 (4) v (4) 9	9·3
11	3309	...	Sa	5−10, 6+1, 8+4, 9+12	8·4
11	3309	33	Wi	8−1	8·9
12	3310	32	Ca	7 (1) v (3) 8	8·6
13	3311	44	Wi	8−3	9·1
13	3311	50	Ma	6 (3) v (1) 8, 8+2	8·7
15	3313	30	Bn	6 (3) v (1) 8	8·7
15	3313	45	Br	6−1, 8+2	8·6
17	3315	37	Lp	6 (2) v (2) 8	8·7
18	3316	22	Ni	8 (2·5) v (3·5) 9	9·2
20	3318	37	Lp	=7	8·5
21	3319	50	Bo	8−1	8·9*b*
22	3320	...	Sa	5−10, 6+1, 8+3	8·4
24	3322	30	Bn	6 (2) v (1) 8	8·7
24	3322	...	Sa	5−12, =6, 8+3	8·5
24	3322	37	Lp	5 (4) v (1) 8, =6	8·5*b*
26	3324	,,	,,	=6	8·5*b*
26	3324	50	Ma	8+1·5	8·7
29	3327	60	Kw	6−2, =8	8·8*b*
29	3327	30	Bn	6 (2) v (1) 8	8·7
Oct					
1	3329	45	Br	6+2	8·3
4	3332	...	Sa	2−14, 5−10, 6+3, 8+6	8·3
6	3334	50	Bn	6+1	8·4
6	3334	37	Lp	5 (2) v (1) 6	8·1*b*
7	3335	,,	,,	5 (2) v (2) 6	7·9
7	3335	40	Hw	6 (2) v (8) 8	8·6
12	3340	60	Kw	5 (9) v (1) 8, 6+1, 8+3	8·6
12	3340	50	Bn	e (4) v (1) 6	8·4
12	3340	37	Lp	5 (2) v (2) 6	7·9
13	3341	22	Ni	3 (8) v (1) 6	8·4
13	3341	34	Li	7 (2) v (8) 8	8·6*b*
13	3341	55	Bo	5 (8) v (4) 6	8·1*b*
14	3342	...	Sa	2−8, 5−6, 6+7, 8+6	7·9
14	3342	33	Wi	6−5, 8+5	8·7
15	3343	37	Lp	5 (1) v (2) 6	7·7
15	3343	60	Kw	2 (2) v (2) 8, 2−6, 5−4	7·8
15	3343	34	Li	7 (7) v (3) 8	8·7
16	3344	40	Hw	2 (7) v (3) 6	8·1

Sept. 13, Ma, Pale yellow.
Oct. 12, Lp, Yellowish.
Oct. 15, Lp, Golden yellow.

1922					
Oct					
17	3345	25	Gr	6+5	8·0*b*
18	3346	22	Ni	3 (6) v (2) 6	8·3
18	3346	37	Lp	5 (1) v (2) 6	7·7
21	3349	45	Br	3−6, 6+4	8·1
22	3350	30	Bn	e (1) v (2) 6	8·1
22	3350	37	Lp	2 (1) v (2) 6, =5	7·4
24	3352	,,	,,	=5	7·3
24	3352	22	Ni	3 (7) v (2) 6	8·3
25	3353	90	Bh	5−8, 8+7	8·1*b*
27	3355	...	Sa	2−3, 5−1, 6+10, 8+12	7·5
28	3356	55	Bo	5−3	7·6
28	3356	30	Bn	5 (3) v (2) e	7·6
28	3356	32	Ca	4 (1) v (8) 7	7·6
28	3356	40	Hw	2 (5) v (5) 5	7·2
28	3356	37	Lp	5 (1) v (2) 6	7·7*b*
28	3356	34	Li	=7	8·5
Nov					
1	3360	...	Sa	2−2, 5−1, 6+12, 8+15	7·3
1	3360	37	Lp	=5	7·3*b*
1	3360	34	Li	=4	7·5
4	3363	48	Bg	3−2, 6+8	7·7
4	3363	45	Br	3−2	7·7
4	3363	50	Bn	5 (2) v (1) e, 3−0·5	7·6
4	3363	45	Bh	2−3, 5−1, 6+10	7·4
6	3365	34	Li	=4	7·5
6	3365	33	Wi	5−6, 6+6	7·9
7	3366	...	Sa	2−4, 5−1, 6+10, 8+12	7·5
9	3368	22	Ni	3 (5) v (4) 6	8·1
9	3368	45	Bh	2−2, 5+1	7·2
11	3370	37	Lp	=5	7·3*b*
14	3373	45	Bh	=5	7·3
15	3374	50	Bn	5 (2) v (1) e, 3−1	7·7
15	3374	30	Co	5 (1) v (2) 6	7·7
15	3374	31	D	5 (4) v (1) 6, 6+3	8·2
17	3376	...	Sa	2−4, 5−1, 6+10, 8+13	7·5
18	3377	37	Lp	5 (1) v (4) 6	7·5
18	3377	32	Ca	5 (9) v (3) 6	8·2
18	3377	25	Bn	3 (3) v (1) e	7·8
19	3378	45	Bh	5 (1) v (4) 8	7·6
23	3382	30	Co	5 (2) v (1) 6	8·1
24	3383	...	Sa	2−7, 5−6, 6+8, 8+10	7·8
24	3383	37	Lp	5 (2) v (2) 6	7·9
24	3383	45	Br	3−5, 6+5	8·0
24	3383	30	Bn	e (1) v (3) 6	8·0
24	3383	,,	Bg	3−7, 6+3	8·2*b*
25	3384	45	Bh	5 (1) v (1) 8	8·1
26	3385	22	Ni	3 (7·5) v (1·5) 6	8·3
27	3386	55	Bo	5 (7) v (5) 6	8·0
Dec					
1	3390	30	Co	6+2	8·3
2	3391	...	Sa	2−7, 5−4, 6+7, 8+7	7·8
5	3394	90	Bh	=6, 8+3	8·5
6	3395	30	Bn	e (4) v (1) 6	8·4
6	3395	37	Lp	=6	8·5*b*
11	3400	90	Bh	8+2	8·6
11	3400	45	Br	6+2	8·3
14	3403	40	Hw	=6	8·5
14	3403	22	Ni	8 (4) v (4) 9	9·3
16	3405	90	Bh	=8	8·8

Oct. 22, Lp, Yellow.

(4557) S URSÆ MAJORIS—*continued.*

1922 Dec						1923 Mar					
20	3409	55	Bo	8 (3) v (1) h	9·1	2	3481	90	Bh	=22, 27+7	11
20	3409	30	Bn	h (3) v (2) 9	9·5	5	3484	...	Sa	19−2, 22+2	11
20	3409	31	D	8−3, h+1	9·1	5	3484	94	Li	=22	11
20	3409	37	Lp	8 (2) v (2) 9	9·3*b*	6	3485	50	Bn	23−1	11
20	3409	44	Wi	8−3	9·1	7	3486	32	Ca	22 (3) v (1) 26	11
22	3411	30	Co	9+3	9·4*b*	8	3487	90	Bh	10−6	10
23	3412	55	Bg	8−3, 9+6	9·1*b*	16	3495	30	Co	15−2, 16−1	10
23	3412	100	Lp	=9	9·7*b*	17	3496	94	Ni	13 (6) v (1·5) 16	10
23	3412	...	Sa	6−3, 8−2, 9+5	9·0	17	3496	,,	Li	14 (5) v (5) 16	10
25	3414	45	Bh	8−3, 9+6	9·1	17	3496	90	Hw	16 (5) v (5) 19	10
26	3415	30	Bn	h−4, 9+1	9·6	17	3496	,,	Bh	10−1	10
26	3415	100	Lp	8 (2) v (2) 9	9·3*b*	17	3496	50	Bn	14 (3) v (2) 19	10
26	3415	22	Ni	8 (6) v (1) 9	9·6	18	3497	32	Ca	14 (2) v (2) 16	10
26	3415	44	Wi	9+2, 13+5	9·6	18	3497	30	Co	=15, 16+2	10
1923 Jan						18	3497	...	Sa	16−2, 19+3	10
						21	3500	90	Bh	8−10, =10	9
4	3424	45	Bh	10−2, 22+10	10·1	24	3503	50	Bn	9 (2) v (1) 10	9
6	3426	90	,,	=13	10·1	24	3503	44	Li	8 (9) v (1) 9	9
6	3426	100	Lp	=14	10·3*b*	24	3503	22	Ni	9+0·5	9
6	3426	44	Li	14 (3) v (7) 15	10·3	24	3503	30	Co	=13, 14+2	10
6	3426	120	Wi	13−3, 16+3	10·4	26	3505	,,	,,	13+3	9
8	3428	,,	,,	13−4, 16+2	10·5	26	3505	31	D	h−3, 9+2	9
8	3428	...	Sa	9−2, =13, 16+2	10·2	27	3506	45	Bh	=10	9
9	3429	94	Ni	=16	10·7	Apr					
9	3429	32	Ca	13 (2) v (4) 16	10·3	1	3511	90	,,	8−8, 10+3	9
10	3430	30	Co	=15	10·4*b*	3	3513	30	Co	8 (2) v (1) 9	9
10	3430	55	Bg	14−0·5, 15+0·5	10·3	4	3514	50	Bn	h (3) v (2) 9	9
14	3434	75	Bn	19 (2) v (1) 22	11·0	4	3514	22	Ni	8 (3) v (3) 9	9
14	3434	90	Bh	10−7	10·6	6	3516	62	Wf	=8, 9+7	8
14	3434	44	Li	15 (5) v (5) 16	10·5	8	3518	44	Li	8 (3) v (7) 9	9
14	3434	100	Lp	19 (2) v (2) 22	11·0*b*	8	3518	37	Lp	7 (2) v (2) 8	8
16	3436	,,	,,	=22	11·1	8	3518	90	Bh	10+5	9
16	3436	40	Hw	=16	10·7	8	3518	75	Bn	8 (2) v (1) h	9
16	3436	30	Co	=16, 19+2	10·7	8	3518	55	Bg	=8	8
18	3438	160	Br	19+2	10·7	9	3519	22	Ni	8 (5) v (2·5) 9	9
20	3440	90	Bh	10−10	10·9	11	3521	32	Ca	8 (4) v (5) 9	9
20	3440	150	Lp	=22	11·1	13	3523	30	Bn	8 (1) v (3) h	8
20	3440	44	Li	16 (5) v (5) 17	10·6	13	3523	37	Lp	=8	8
20	3440	94	Ni	22−0·5	11·1	13	3523	34	Li	6 (3) v (7) 8	8
21	3441	...	Sa	13−7, 16−2, 26+5, 28+5	11·0	14	3524	44	Wi	=8	8
						14	3524	...	Sa	=8	8
23	3443	62	Wf	19−1, =22	11·1	14	3524	30	D	8−3, h+2	9
23	3443	100	Lp	22 (1) v (2) 23	11·2	14	3524	,,	Co	8−3	9
24	3444	120	Bn	=22	11·1	14	3524	90	Bh	8−5, 10+6	9
27	3447	90	Bh	=22	11·1	15	3525	62	Wf	8−4, 9+5	9
30	3450	,,	,,	=22, 27+6	11·2*b*	15	3525	22	Ni	8 (4) v (4) 9	9
Feb						17	3527	32	Ca	8 (2) v (7) 9	9
4	3455	120	Bn	22 (2) v (1) 23	11·3	19	3529	30	Co	8−2	9
4	3455	160	Br	19−4, 22−2	11·3*b*	19	3529	,,	D	8−3, h+3	9
5	3456	100	Lp	19 (2) 23 (2) v	12·0*b*	19	3529	34	Li	=6	8
6	3457	94	Li	=22	11·1	20	3530	55	Bg	=6, 8+3	8
6	3457	,,	Ni	22 (4) v (1·5) 23	11·3	20	3530	30	Bn	6 (2) v (1) 8	8
6	3457	...	Sa	26−2, 28+1	11·8	21	3531	32	Ca	8 (1) v (8) 9	8
7	3458	62	Wf	22−2, 26+2	11·3	22	3532	22	Ni	8 (3) v (4) 9	9
7	3458	80	Ca	22−1, =21	11·2	22	3532	90	Bh	8−3, 10+8	9
8	3459	90	Bh	27+1	11·8	24	3534	75	Bn	6 (1) v (1) 8	8
13	3464	94	Ni	=23	11·4	25	3535	32	Ca	7−3, =8	8
16	3467	32	Ca	=23, 26+1	11·5	26	3536	34	Li	5 (8) v (2) 6	8
16	3467	90	Bh	27+2	11·7	26	3536	30	Co	=8	8
23	3474	,,	,,	22−4, 27+2	11·6	27	3537	,,	D	=8	8
25	3476	,,	,,	22−5, 27+2	11·6	27	3537	45	Br	=6	8
25	3476	120	Bn	22−4, 23−1	11·5	28	3538	30	Co	8−1	8
26	3477	75	Bg	=22	11·1*b*	28	3538	...	Sa	7+4, 6+4	8
						May					
						1	3541	90	Bh	8+1	8
						1	3541	32	Ca	6 (2) v (2) 8	8
						2	3542	30	D	8−1	8
						3	3543	55	Bg	=6	8

Feb. 4, Br, Difficult.
Feb. 5, Difficult.
Feb. 26, About.

(4557) S URSÆ MAJORIS—*continued.*

1923						1923					
May						July					
3	3543	50	Bn	6+1	8·4	6	3607	55	Bg	6 (1) v (3) 8	8·6
3	3543	37	Lp	=6	8·5*b*	6	3607	30	D	6+2	8·3
3	3543	...	Sa	=6	8·5	7	3608	50	Gr	=8	8·8
4	3544	34	Li	5 (8) v (2) 6	8·3	8	3609	62	Wf	=6, 8+2	8·6
5	3545	44	Wi	=6, 8+5	8·4	8	3609	...	Sa	5−4, 6+8	7·7
5	3545	22	Ni	8 (1) v (6) 9	9·0	8	3609	30	D	6+2	8·3
6	3546	62	Wf	6−4, =8	8·9	10	3611	32	Ca	4 (7) v (3) 7	8·2
7	3547	90	Bh	8+3	8·5	10	3611	22	Ni	=6	8·5
8	3548	45	Br	=6	8·5	11	3612	30	Co	6+3·5	8·2
9	3549	32	Ca	6 (1) v (2) 8	8·6	12	3613	,,	D	6+1	8·4
10	3550	30	D	6−0·5	8·6	12	3613	37	Lp	=6	8·5
11	3551	37	Lp	=6	8·5*b*	13	3614	34	Li	5 (8) v (2) 6	8·3
12	3552	...	Sa	5−7, 6+6	8·0	14	3615	50	Gr	6+5	8·0
12	3552	34	Li	5 (5) v (5) 6	7·9	14	3615	45	Bh	6+3, 8+6	8·2
13	3553	90	Bh	8+4	8·4	15	3616	62	Wf	6−3, =8	8·8
13	3553	30	D	6−1, 8+2	8·6	17	3618	30	D	6−1, 8+2	8·6
16	3556	37	Lp	6 (2) v (2) 8	8·7	18	3619	37	Lp	6 (2) v (2) 8	8·7
16	3556	30	Bn	e (2) v (1) 6	8·3	18	3619	...	Sa	5−10, 6+4, 7+4, 8+7	8·2
17	3557	32	Ca	=6	8·5						
20	3560	F	Wf	5−8, 6+1	8·3	19	3620	50	Gr	=8	8·8
21	3561	25	Bn	e (2) v (1) 6	8·3	20	3621	45	Bh	5−10, 6+2	8·3
21	3561	90	Bh	5−10, 8+5	8·3	20	3621	30	Co	6+3	8·2
23	3563	34	Li	5 (5) v (5) 6	7·9	20	3621	,,	D	6−2, 8+1	8·7
23	3563	...	Sa	5−5, 6+5	7·9*b*	21	3622	34	Li	5 (6) v (4) 6	8·0
24	3564	22	Ni	3 (7) v (2) 6	8·3	22	3623	62	Wf	=8	8·8
24	3564	30	D	5 (4) v (1) 6, 6+3	8·2	22	3623	37	Lp	6 (3) v (2) 8	8·7*b*
25	3565	37	Lp	=6	8·5*b*	24	3625	50	Bn	6+1	8·4
26	3566	30	Co	5−4, 6+5	7·9*b*	25	3626	55	Bg	6 (1) v (3) 8	8·6
27	3567	,,	D	5 (4) v (1) 6, 6+3	8·2	25	3626	30	Co	=6	8·5
30	3570	90	Bh	5−8, 8+7	8·1	25	3626	...	Sa	5−12, 6+3, =7 8+3	8·4
31	3571	32	Ca	3 (3) v (7) 7	7·8						
June						26	3627	37	Lp	=7, 6 (2) v (2) 8	8·6*b*
2	3573	90	Bh	5−7, 6+5, 8+6	8·1	28	3629	50	Bn	6+1	8·4
2	3573	34	Li	5 (3) v (7) 6	7·7	30	3631	45	Bh	=6	8·5
3	3574	F	Wf	3 (4) v (6) 6	7·9	Aug					
4	3575	30	D	5 (3) v (2) 6, 6+5	8·0*b*	1	3633	22	Ni	8 (2) v (4) 9	9·1
10	3581	,,	,,	5 (2) v (1) 6, 6+5	8·1	2	3634	30	Co	=7, =8	8·7
10	3581	34	Li	5 (1) v (9) 6	7·4	3	3635	50	Bn	8 (3) v (1) h	9·1
11	3582	...	Sa	2−1, 5+1	7·2	3	3635	45	Bh	=6	8·5
11	3582	32	Ca	3 (3) v (7) 7	7·8	3	3635	55	Bg	8 (1) v (4) 9	9·0
11	3582	90	Bh	5−7, 6+5	8·0	6	3638	62	Wf	8−2, 9+7	9·0
11	3582	30	Bn	3 (1) v (3) e	7·6	7	3639	32	Ca	8 (4) v (7) 10	9·2
17	3588	37	Lp	5 (1) v (2) 6	7·7*b*	8	3640	50	Bn	8 (2) v (1) h	9·1
18	3589	30	D	5 (3) v (2) 6, 6+6	8·0	9	3641	90	Bh	8−2	9·0
18	3589	...	Sa	3−5, 4−2, 5 3, 6+10	7·7	9	3641	45	Br	=8	8·8
						9	3641	...	Sa	8−3	9·1
21	3592	90	Bh	6+3, 8+6	8·2	11	3643	30	Co	8 (2) v (1) 9	9·4*b*
23	3594	30	D	5 (3) v (1) 6, 6+4	8·2	11	3643	,,	D	8−4, h+1	9·2
26	3597	,,	,,	5 (3) v (1) 6, 6+4	8·2	11	3643	37	Lp	8 (2) v (1) 9, 8 (2) v (2) 13	9·5*b*
27	3598	37	Lp	5 (1) v (2) 6	7·7*b*						
28	3599	62	Wf	3−5, 6+5	8·0	12	3644	62	Wf	8−5, 13+7	9·4
29	3600	30	D	5 (3) v (1) 6, 6+4	8·2	13	3645	25	Bn	h (1) v (1) 9	9·5
30	3601	...	Sa	2−8, 5−6, 6+10, 8+12	7·7	15	3647	...	Sa	6−8, 8−5, =13, 14+2, 15+7	9·7
July						15	3647	37	Lp	8 (2) v (1) 13	9·7
1	3602	32	Ca	4 (7) v (3) 7	8·2	15	3647	90	Bh	6−10, 8−8	9·6
1	3602	30	D	5 (3) v (1) 6, 6+4	8·2	22	3654	,,	,,	13+3, 14+4, 16+8	9·8
2	3603	37	Lp	5 (1) v (2) 6	7·7*b*	22	3654	70	D	9−4, 13+1	10·1
4	3605	30	D	5 (4) v (1) 6, 6+3	8·2	26	3658	100	Lp	=13	10·1*b*
4	3605	50	Bn	3 (2) v (1) 6, =e, 6+3	8·1	26	3658	90	Bh	=13, 16+5	10·1
						28	3660	...	Sa	13−2, =16, 19+5	10·5
5	3606	30	Co	6+4	8·1	29	3661	150	Wf	13−1, 16+5	10·2
5	3606	22	Ni	3 (7) v (1·5) 6	8·3	30	3662	37	Lp	=14	10·3*b*
						30	3662	50	Gr	=16	10·7

May 11, Uncertain.
May 24, June 18, D, 5^{c}.
June 10, D, 3^{c}.

July 21, 5^{c}.
Aug. 22, D, 5-in. OG.

(4557) S URSÆ MAJORIS—*continued.*

1923						1923					
Aug						Nov					
30	3662	80	Co	19+2	10·7	5	3729	...	Sa	16−6, =26, 28+6	11·
30	3662	50	Bn	14 (1) v (1) 19	10·6	5	3729	160	Br	22−2	11·
30	3662	90	Bh	=14, 19+6	10·3*b*	6	3730	120	Bn	22 (2) v (3) 26, 23−1	11·
31	3663	,,	,,	16+1	10·6	7	3731	90	Bh	22−1	11·
Sept						8	3732	94	Ni	22+0·5	11·
1	3664	60	D	13−2, 16+4	10·3	9	3733	90	Bh	=19, 22+2	10·
2	3665	94	Ni	16 (1) v (5) 22	10·7	10	3734	120	Bn	19 (1) v (2) 22	11·
2	3665	90	Bh	=16	10·7	10	3734	60	D	16−1, 22+3	10·
5	3668	50	Bn	19+1	10·8	11	3735	30	Co	=16	10·
5	3668	80	Co	=22	11·1	14	3738	94	Ni	16 (3) v (1) 22	11·
5	3668	100	Lp	=19	10·9*b*	14	3738	50	Bn	14 (5) v (2) 19	10·
5	3668	50	Ma	16 (1) v (3) 22	10·8	15	3739	90	Bh	14−3, =16, 19+3	10·
5	3668	...	Sa	16−3, =19, 26+3	11·1	16	3740	45	Br	19+2	10·
6	3669	62	Wf	=16. 22+5	10·6	17	3741	65	Bg	=11	10·
7	3670	80	Co	=22	11·1	17	3741	100	Lp	13 (2) v (2) 16	10·
8	3671	90	Bh	16−3, 22+1	11·0	19	3743	50	Bn	9 (3) v (1) 11	9·
8	3671	160	Br	19−1, 22+1	11·0	19	3743	90	Bh	=14, 19+6	10·
8	3671	60	D	16−3, 22+1	11·0	22	3746	32	Ca	9 (1) v (3) 13	9·
9	3672	94	Ni	16 (3·5) v (2·5) 22	10·9	23	3747	45	Bh	13−2, =14	10·
9	3672	79	Ma	16 (5) v (1) 22	11·0	24	3748	...	Sa	9−5, =11, 13+1	10·
11	3674	50	Bn	19 (1) v (2) 22	11·0	30	3754	30	Co	9+3	9·
11	3674	90	Bh	16−4, 22+1	11·0	30	3754	50	Bn	=9	9·
12	3675	48	Bg	=22	11·1*b*	30	3754	90	Bh	10−2, =13	10·
12	3675	60	D	22−1	11·2	Dec					
12	3675	50	Gr	=22	11·1	2	3756	30	Co	9+4	9·
13	3676	62	Wf	18−1, 22+1	11·0	3	3757	...	Sa	8−6, 9+4	9·
14	3677	80	Ca	22 (1) v (1) 21	11·3	3	3757	50	Bn	h−3, 9+2	9·
15	3678	100	Lp	=23	11·4*b*	4	3758	90	Bh	10−1	10·
15	3678	79	Ma	22−1	11·2	8	3762	,,	,,	6−10, 10+4	9·
16	3679	50	Bn	19 (2) v (1) 22	11·0	9	3763	55	Bg	8 (1) v (3) h	8·
17	3680	40	Hw	=19	10·9	9	3763	45	Br	8−2	9·
18	3681	...	Sa	16−5, =21, 26+5	11·1	9	3763	30	Co	8−5	9·
22	3685	90	Bh	16−5, 22−1	11·2	9	3763	,,	D	8−3, h+2	9·
23	3686	120	Bn	22−4, 23−1, =26	11·5*b*	9	3763	100	Lp	8−1	8·
23	3686	79	Ma	22−2	11·3	9	3763	94	Ni	8 (5) v (1·5) 9	9·
26	3689	90	Bh	16−3, 22+1	11·0	12	3766	62	Wf	8−2, 9+8	9·
29	3692	120	Bn	28 (1) v (3) 30	12·1	13	3767	...	Sa	6	8·
29	3692	...	Sa	27−3, 29+1	12·1	14	3768	32	Ca	8 (4) v (5) 9	9·
29	3692	62	Wf	22−6, =26	11·6	15	3769	37	Lp	6 (2) v (2) 8	8·
30	3693	160	Br	19−5, 22−3	11·4	15	3769	30	Co	8−4	9·
30	3693	80	Co	Estimated	<11·5	16	3770	50	Bn	8	8·
30	3693	60	D	=28	11·9*b*	18	3772	30	Co	8−1	8·
30	3693	90	Bh	22−4	11·5	18	3772	90	Bh	6−6, 8−4	9·
Oct						20	3774	50	Bn	6 (3) v (1) 8	8·
4	3697	120	Bn	28 (2) v (1) 30	12·3	22	3776	90	Bh	=8	8·
4	3697	100	Lp	=25	11·8*b*	23	3777	100	Lp	6 (2) v (2) 8	8·
4	3697	79	Ma	=26	11·6*b*	24	3778	...	Sa	6+2, 8+5	8·
4	3697	...	Sa	=30	12·5	24	3778	30	Co	8−2	9·
4	3697	90	Bh	22−5	11·6	24	3778	90	Bh	6−2, 8+1	8·
6	3699	,,	,,	22−5	11·6	28	3782	...	Sa	5−8, 6+1, 8+5	8·
8	3701	150	Wf	=26	11·6	28	3782	45	Br	6+1, 8+3	8·
11	3704	160	Br	26−2, 28+2	11·8	28	3782	30	Co	6−3, 8+2	8·
11	3704	90	Bh	22−5	11·6	30	3784	,,	D	6+1	8·
11	3704	...	Sa	27−2, 30+2	12·2	1924					
14	3707	120	Bn	28 (2) v (1) 30	12·3	Jan					
21	3714	...	Sa	=29	12·1	2	3787	50	Bn	6+1·5	8·
25	3718	90	Bh	22−4	11·5	3	3788	55	Bg	6	8·
28	3721	62	Wf	22−2, 26+3	11·3	3	3788	34	Sa	2−14, 5−10, 6+2, 8+5	8·
28	3721	120	Bn	28 (1) v (1) 30	12·2	3	3788	22	Ni	6 (3·5) v (1·5) 8	8·
Nov						4	3789	45	Bh	6+2, 8+5	8·
3	3727	,,	,,	22 (2) v (1) 26	11·4	4	3789	30	Co	6+2	8·
3	3727	100	Lp	=25	11·8*b*	4	3789	,,	D	6+2	8·
						5	3790	40	,,	6+1	8·
						5	3790	,,	Hw	v (5) 6 (5) 8	8·
						6	3791	50	Bn	e−5, 6+2	8·
						6	3791	37	Lp	6+1	8·
						6	3791	45	Br	6−1, 8+2	8·

Sept. 12, Bg, About.
Sept. 30, Co, Invisible. D, About.
Oct. 4, Lp, Difficult. Ma, About.
Nov. 3, Lp, Difficult.

(4557) S URSÆ MAJORIS—*continued.*

1924 Jan					
6	3791	30	Co	=6, 8+4	8·5
6	3791	44	Wi	6+2	8·3
7	3792	30	D	5 (3) v (1) 6, 6+3	8·2
7	3792	45	Bh	5 (3) v (1) 6	8·2
11	3796	,,	,,	3 (1) v (1) 6	8·0
12	3797	30	D	5 (4) v (1) 6, 6+2·5	8·3
14	3799	,,	Co	6+4	8·1*b*
15	3800	22	Ni	6 (1) v (4) 8	8·6
15	3800	30	D	5 (3) v (1) 6, 6+4	8·2*b*
15	3800	,,	Bg	3 (5) v (1) 6	8·3*b*
16	3801	32	Ca	4 (7) v (3) 7	8·2
16	3801	45	Bh	5−5, 3 (1) v (3) 6, 3−2	7·8
17	3802	40	Hw	6 (5) v (5) 8	8·7*b*
20	3805	50	Bn	e (1) v (3) 6	8·0
20	3805	45	Bh	6+5, 8+10	7·9
20	3805	30	Co	5−4, 3−4, 4−4	7·9*b*
23	3808	22	Ni	3 (7) v (1) 6	8·4
25	3810	45	Bh	5 (2) v (3) 6, 3−3	7·8
25	3810	100	Lp	5 (2) v (1) 6	8·1*b*
25	3810	40	Hw	2 (7) v (3) 6	8·1*b*
25	3810	25	Bn	e (1) v (2) 6	8·1
25	3810	30	Co	5−4	7·7
27	3812	,,	,,	5−3, 3−3·5	7·7
27	3812	,,	Bg	3 (1) v (3) 6	7·8
27	3812	34	Sa	2−7, 3−4, 4−4, 6+7, 8+10	7·8
27	3812	45	Br	3−4	7·9
27	3812	30	D	5 (2) v (1) 6, 6+4	8·1
29	3814	32	Ca	4 (7) v (3) 7	8·2
29	3814	25	Bn	5 (3) v (1) e	7·7
31	3816	45	Bh	5 (1) v (2) 6	7·7
Feb					
1	3817	30	D	5 (2) v (1) 6, 6+4	8·1
1	3817	,,	Co	5−0·5, 3−1	7·5
1	3817	40	Hw	5 (3) v (7) 6	7·7*b*
1	3817	30	Bn	e+1	7·8
3	3819	50	Ma	2 (5) v (1) 6	8·3
3	3819	37	Lp	5 (2) v (2) 6	7·9
4	3820	90	Bh	5−4, 4−2	7·7
6	3822	34	Sa	5−6, 6+6	7·9
8	3824	37	Lp	5 (2) v (2) 6	7·9*b*
8	3824	F	Wf	3−7, 6+3	8·2
8	3824	30	D	5 (3) v (2) 6, 6+5	8·0
8	3824	,,	Co	5−1·5, 3−2	7·6
9	3825	32	Ca	4 (7) v (3) 7	8·2
11	3827	45	Bh	3 (1) v (2) 6	7·8
14	3830	,,	,,	6+4	8·1*b*
14	3830	22	Ni	=6	8·5
14	3830	30	D	5 (4) v (1) 6, 6+3	8·2
14	3830	100	Lp	5 (4) v (1) 6	8·3*b*
14	3830	68	Ha	5 (2) v (1) 6	8·1*b*
16	3832	,,	,,	5 (3) v (1) 6	8·2
16	3832	25	Bn	=e	7·9
16	3832	34	Sa	2−10, 3−6, 6+5	8·0
16	3832	30	Co	6+5	8·0*b*
17	3833	,,	D	5 (3) v (1) 6, 6+3	8·2*b*
18	3834	45	Bh	5 (4) v (1) 6	8·3
21	3837	,,	,,	5 (2) v (1) 6	8·1
22	3838	33	Ha	3 (4) v (1) 6	8·3
22	3838	30	Co	=6	8·5
23	3839	40	D	5 (3) v (1) 6, 6+3	8·2
23	3839	22	Ni	3 (7) v (1) 6	8·4

Jan. 12, 27, Feb. 1, D, 4c.
Feb. 8, D, 3c.

1924 Feb					
23	3839	32	Ca	3 (1) v (2) 6	8·3
24	3840	25	Bn	e (1) v (3) 6	8·0
24	3840	F	Ha	3 (9) v (1) 6	8·4
24	3840	45	Br	3−6, 6+3	8·2
26	3842	,,	Bh	6+2	8·3
26	3842	33	Ha	3 (9) v (1) 6	8·4
28	3843	,,	,,	=6	8·5
28	3844	40	Hw	5 (6) v (4) 6	8·0*b*
28	3844	30	D	6−1, 8+3	8·6
28	3844	,,	Co	6−1, 8+3·5	8·5
Mar					
1	3846	,,	,,	6−2, 8+2	8·7
1	3846	45	Bh	6−2, 8+2	8·7
2	3847	34	Sa	2−12, 6+2, 8+5	8·3
4	3849	40	D	6+1	8·4
4	3849	30	Co	6 (2) v (2) 8	8·7
4	3849	45	Bh	6−3, 8+1	8·8
4	3849	100	Lp	6+1	8·4
4	3849	33	Ha	=6	8·5
4	3849	25	Bn	e (4) v (1) 6	8·4
5	3850	32	Ca	6 (1) v (2) 8	8·6
5	3850	22	Ni	6 (1) v (3) 8	8·6
5	3850	33	Wi	6−1	8·6
6	3851	33	Ha	=6	8·5
7	3852	,,	,,	6 (2) v (3) 8	8·6
7	3852	45	Bh	6+1	8·4
8	3853	55	Bg	6 (1) v (3) 8	8·6
8	3853	25	Bn	e (7) v (2) 6	8·4
8	3853	100	Lp	8−1	8·9
8	3853	50	Ma	6 (1) v (4) 8	8·6
8	3853	30	Co	6−0·5, 8+3	8·5
8	3853	,,	D	6−2, 8+1·5	8·7
8	3853	33	Ha	=8	8·8*b*
9	3854	,,	,,	6 (3) v (2) 8	8·7
9	3854	45	Bh	6+3	8·2
9	3854	44	Wi	6−1, 8+2	8·6
10	3855	33	,,	6−3, 8+1	8·8
10	3855	32	Ca	8 (1) v (3) h	8·9
10	3855	34	Sa	=8	8·8
10	3855	50	Bn	6+1·5	8·4
11	3856	F	Ha	6 (1) v (1) 8	8·7
11	3856	100	Lp	7 (1) v (2) 9	8·9*b*
11	3856	50	Ma	6 (2) v (1) 8	8·7
11	3856	45	Bh	6+2	8·3
11	3856	30	Co	6−1, 8+3	8·6
11	3856	,,	D	6−3, 8+1	8·8
12	3857	22	Ni	6 (1) v (2) 8	8·6
12	3857	55	Bg	6 (1) v (3) 8	8·6
13	3858	F	Ha	6 (4) v (1) 8	8·8
13	3858	30	Co	6−1, 8+3	8·6
15	3860	45	Bh	6+1	8·4
16	3861	30	Co	6−3, 8+1	8·8
17	3862	40	Hw	6 (5) v (5) 8	8·7*b*
19	3864	50	Bn	6 (3) v (2) 8	8·7
19	3864	33	Ha	=8	8·8
19	3864	30	D	8−3	9·1*b*
19	3864	45	Bh	=6	8·5
22	3867	,,	,,	6−4, 8−1	8·9
24	3869	30	Co	8−3·5	9·2
24	3869	44	Wi	6−3, =8	8·8
24	3869	40	Hw	6 (5) 8 (5) v	9·2

Feb. 23, Ca, 3=Hagen's 3 in T Urs. Ma. field, 8m·2.
Mar. 4, D, 5c.
Mar. 11, D, 4c.

(4557) S URSÆ MAJORIS—*continued.*

1924						1924					
Mar						May					
24	3869	55	Bg	6 (1) v (3) 8	8·6	13	3919	60	D	16−3, 22+1	11
25	3870	32	Ca	8 (5) v (4) 9	9·3	13	3919	94	Ni	=22	11
26	3871	45	Bh	8−2	9·0	16	3922	90	Sa	=19	10
27	3872	34	Sa	6−8, 8−2, 9+10	9·0	19	3925	68	Ha	22 (2) v (2) 26	11
28	3873	30	Co	8−4	9·2	19	3925	50	Bn	22 (2) v (1) 23	11
29	3874	50	Bn	8 (3) v (2) h	9·1	21	3927	60	D	=22	11
29	3874	37	Lp	8 (2) v (3) 9	9·2*b*	22	3928	90	Bh	10 (4) v (1) 19	10
29	3874	45	Br	=8	8·8	23	3929	60	D	22−2, 26+3	11
29	3874	,,	Bh	8 (2) v (3) 9	9·2	23	3929	62	Wf	22−4, =23	11
30	3875	30	D	8−1, h+4	8·9	25	3931	94	Ni	22 (3) v (2) 23	11
30	3875	22	Ni	8 (5) v (2·5) 9	9·4	26	3932	60	D	22−3, 26+1	11
30	3875	50	Ma	8−8, 11+5, 13+6	9·5	27	3933	32	Ca	=23	11
31	3876	44	Wi	8−1	8·9	27	3933	90	Bh	19−2	11
						27	3933	100	Lp	=23	11
Apr						27	3933	68	Ha	22 (3) v (2) 23	11
1	3877	,,	,,	8−4	9·2	27	3933	50	Bn	22 (2) v (1) 23	11
1	3877	30	Co	8 (2) v (2) 9	9·3*b*	28	3934	80	Co	21−2	11
1	3877	50	Bn	h+1	9·1	29	3935	62	Wf	22−4, 23+1	11
2	3878	18	Sg	6 (1) v (3) 13, =8	8·9	30	3936	55	Bg	=22	11
4	3880	50	Bn	h (1) v (2) 9	9·4	30	3936	60	D	22−3, 26+2	11
4	3880	90	Bh	8−4, 9+4	9·3*b*	June					
4	3880	30	Co	9+2	9·5*b*	1	3938	,,	,,	22−2, 26+3	11
4	3880	,,	D	h−4, 9+2	9·6	2	3939	68	Ha	22 (3) v (2) 26	11
5	3881	44	Wi	8−3	9·1	2	3939	79	Ma	=23	11
5	3881	40	Hw	8 (3) v (7) 9	9·1	4	3941	90	Bh	22−2	11
6	3882	55	Bg	8 (1) v (3) 9	9·1*b*	5	3942	60	D	22−2, 26+3	11
7	3883	50	Bn	h (3) v (2) 9	9·5	6	3943	32	Ca	22 (2) v (2) 23	11
7	3883	37	Lp	8 (7) v (3) 9	9·5*b*	7	3944	62	Wf	18−2, =22	11
7	3883	32	Ca	9 (1) v (1) 10	9·8	8	3945	90	Bh	22−2	11
7	3883	30	Co	=9, 10+2	9·7*b*	8	3945	94	Ni	22 (5) v (1·5) 23	11
7	3883	44	Wi	8−4, 9+5	9·2	11	3948	60	D	22−1	11
8	3884	,,	,,	8−6, 9+2	9·5	11	3948	90	Bh	22−3	11
8	3884	90	Bh	8−4, 9+4	9·3	13	3950	,,	,,	16−10, 22−5	11
8	3884	62	Wf	8−5·5, 9+3	9·4	18	3955	,,	,,	19 (1) v (1) 22	11
10	3886	30	D	=9	9·7	19	3956	100	Lp	16 (3) v (2) 19	10
11	3887	32	Ca	=12	10·0	20	3957	120	Bn	19 (1) v (2) 22	11
12	3888	34	Sa	7−10, 8−10, 10+2, 13+6	9·6	21	3958	80	Co	16+2	10
						21	3958	60	D	13−5, 16+2	10
13	3889	45	Bh	8−5, 10+5	9·4	22	3959	62	Wf	18+1, 20+3	10
14	3890	50	Bn	h (4) v (1) 9	9·6	23	3960	100	Lp	14−1	10
15	3891	37	Lp	=11	10·0*b*	24	3961	50	Ma	13 (1) v (1) 16	10
17	3893	94	Ni	9+1	9·6	24	3961	90	Bh	=19	10
20	3896	50	Bn	9 (2) v (1) 10	9·8	26	3963	60	D	13−3, 16+3	10
20	3896	68	Ha	=13	10·1	26	3963	55	Bg	=14	10
20	3896	45	Bh	9+1, 10+1	9·7*b*	26	3963	62	Wf	9−1, 12+2	9
20	3896	32	Ca	13 (2) v (3) 17	10·3	27	3964	34	Sa	8−7, 9+3	9
20	3896	30	Co	=16	10·7	29	3966	60	D	9−3, 13+1	10
24	3900	62	Wf	13−4, =16	10·6	30	3967	100	Lp	=9	9
25	3901	45	Bh	10+2	9·7	30	3967	62	Wf	14+1	10
25	3901	55	Bg	12−2, =14	10·2	30	3967	80	Co	9+3	9
26	3902	34	Sa	13−4, 16+4, 19+2	10·5	30	3967	90	Bh	13 (1) v (1) 16	10
27	3903	44	Wi	16−2, 22+2	10·9	July					
30	3906	90	Bh	=10	9·9	4	3971	,,	,,	13+1	10
May						4	3971	50	Ma	13+3	9
1	3907	50	Bn	14 (3) v (1) 19	10·8	4	3971	68	Ha	8 (7) v (3) 10	9
3	3909	90	Bh	10−4	10·3	4	3971	32	Ca	8 (4) v (5) 9	9
4	3910	68	Ha	16 (1) v (4) 19	10·7	6	3973	,,	,,	8 (3) v (6) 9	9
4	3910	60	D	16−2, 22+2	10·9	6	3973	60	D	h−2, 9+3	9
5	3911	94	Ni	16 (1) v (3) 22	10·8	6	3973	22	Ni	8 (6) v (1) 9	9
5	3911	32	Ca	=22	11·1	7	3974	62	Wf	8−4, 9+7	9
7	3913	60	D	16−4, 22+1	11·0	9	3976	60	D	=h	9
7	3913	34	Sa	14−5, 19+5	10·6	9	3976	90	Bh	6−10, 13+6	9
7	3913	68	Ha	16 (1) v (4) 19	10·7	9	3976	30	Co	8−3·5	9
7	3913	50	Bn	19 (2) v (1) 22	11·0						
9	3915	60	D	22+1	11·0						
10	3916	90	Bh	10−7	10·6						
11	3917	62	Wf	18−3, =22	11·1						
13	3919	90	Bh	10−9, 19+1	10·8						

May 13, D, About.
June 30, Co, Difficult.
July 6, D, 6c.

(4557) S URSÆ MAJORIS—*continued.*

1924					
July					
10	3977	55	Bg	=8	8·8
10	3977	50	Bn	6 (3) v (1) 8	8·7
11	3978	,,	Ma	6 (1) v (2) 8	8·6
11	3978	22	Ni	=8	8·8
12	3979	90	Bh	6−6, 13+10	9·1
12	3979	37	Lp	6 (2) v (1) 8	8·7*b*
13	3980	33	Ha	6 (2) v (3) 8	8·6
13	3980	60	D	=8	8·8
14	3981	50	Bn	6 (1) v (2) 8	8·6
15	3982	33	Ha	6 (2) v (3) 8	8·6
16	3983	30	Co	6−2, 8+1	8·7
18	3985	90	Bh	=8	8·8
18	3985	68	Ha	4 (4) v (1) 6	8·3
19	3986	37	Lp	5 (4) v (1) 6, 6+1	8·3*b*
19	3986	50	Ma	6+1	8·4
19	3986	30	Co	=6, 8+3·5	8·5
20	3987	22	Ni	6 (2) v (1) 8	8·7
21	3988	50	Bn	6+1·5	8·4
22	3989	30	Co	6+1	8·4
23	3990	62	Wf	=6, 8+3	8·5
24	3991	55	Bg	3 (3) v (1) 6	8·3
24	3991	68	Ha	=6	8·5*b*
24	3991	90	Bh	=6	8·5
27	3994	32	Ca	4 (8) v (2) 6	8·3
29	3996	50	Bn	6+2	8·3
29	3996	33	Ha	4 (3) v (2) 6	8·1*b*
29	3996	90	Bh	6+1	8·4
29	3996	30	Co	6+1	8·4
30	3997	50	Ma	6+2	8·3
30	3997	62	Wf	6+1, 8+3	8·5
31	3998	22	Ni	6+0·5	8·5
Aug					
2	4000	90	Bh	5−10, 6+2	8·3
2	4000	30	Co	=6, 8+4	8·5
5	4003	25	Bn	e−4, 6+2	8·3
5	4003	33	Ha	3 (4) v (1) 6	8·3
5	4003	37	Lp	5 (3) v (2) 6	8·0
5	4003	62	Wf	=6, 8+2	8·6
7	4005	90	Bh	5−10, 6+2	8·3
8	4006	50	Ma	8+3	8·5
10	4008	30	Co	6+2·5	8·3
10	4008	,,	D	5 (5) v (1) 6, 6+2	8·3
15	4013	34	Sa	4−5, 5−7, 6+7, 8+10	7·9
15	4013	45	Bh	2 (2) v (1) 6, 3−5	8·0
17	4015	30	Co	6+4	8·1
18	4016	33	Ha	3 (3) v (2) 6	8·1
18	4016	37	Lp	5 (2) v (2) 6	7·9*b*
18	4016	50	Ma	6+3, 8+4	8·3
19	4017	25	Bn	e−4, 6+3	8·2
19	4017	45	Br	3−5, 6+5	8·0
19	4017	90	Bh	5 (1) v (1) 6	7·9
22	4020	62	Wf	6+3, 8+6	8·2
25	4023	30	Bn	e−4, 6+2·5	8·3
25	4023	34	Sa	2−7, 5−2, 6+4, 8+8	7·8
26	4024	33	Ha	4 (4) v (1) 6	8·3
27	4025	75	Bg	6 (1) v (3) 8	8·6
27	4025	62	Wf	6+2, 8+5	8·3
27	4025	90	Bh	2 (1) v (1) 8, 5 (1) v (1) 6	7·9
31	4029	30	Bn	e−4, 6+3	8·2
31	4029	37	Lp	5 (1) v (2) 6	7·7
Sept					
2	4031	45	Bh	5 (1) v (2) 6	7·7
3	4032	34	Sa	2−4, =5, 6+10	7·4
3	4032	62	Wf	3 (8) v (2) 6	8·3
5	4034	90	Bh	2 (3) v (2) 6	7·9
5	4034	33	Ha	4 (3) v (2) 6	8·1
7	4036	,,	,,	4 (4) v (1) 6	8·3
8	4037	90	Bh	2 (3) v (1) 6	8·1
8	4037	34	Sa	5−2, 6+8	7·6
8	4037	40	Hw	=5	7·3
9	4038	25	Bn	e−2, 6+4	8·1
9	4038	50	Ma	2 (3) v (1) 6	8·1
9	4038	33	Ha	4 (3) v (2) 6	8·1
10	4039	62	Wf	5−5, 6+7	7·8
10	4039	40	D	5 (1) v (1) 6, 6+5	7·9
12	4041	22	Ni	3 (6) v (2·5) 6	8·2
14	4043	33	Ha	4 (3) v (2) 6	8·1
16	4045	45	Bh	2 (3) v (1) 6	8·1*b*
17	4046	34	Sa	5−5, 6+10	7·7
22	4051	25	Bn	e−5, 6+2	8·3
22	4051	37	Lp	5 (2) v (3) 6	7·8
22	4051	40	Hw	2 (7) 5 (3) v	7·4
23	4052	33	Ha	4 (4) v (1) 6	8·3
23	4052	45	Bh	=6	8·5
24	4053	30	Bg	3 (2) v (1) 6	8·2
26	4055	62	Wf	6+2, 8+5	8·3
27	4056	50	Bn	6+2	8·3
27	4056	68	Ha	4 (3) v (2) 6	8·1
27	4056	34	Sa	5−7, 6+6, 7+3, 8+5	8·1
27	4056	45	Bh	6+2	8·3
27	4056	,,	Br	6+2	8·3
28	4057	37	Lp	5 (9) v (1) 6	8·4*b*
29	4058	31	D	6+1	8·4
30	4059	45	Bh	5 (4) v (1) 6, 3 (3) v (1) 6	8·3
Oct					
1	4060	33	Ha	4 (1) v (1) 6	8·0
2	4061	45	Bh	6+1	8·4
3	4062	37	Lp	5 (4) v (1) 6	8·3*b*
4	4063	33	Ha	4 (3) v (2) 6	8·1
5	4064	62	Wf	6−2, 8+2	8·7
5	4064	32	Ca	6 (1) v (2) 8	8·6
6	4065	34	Sa	6+2	8·3
8	4067	55	Bg	3 (2) v (1) 6	8·2
8	4067	45	Bh	6−2	8·7
12	4071	50	Bn	6 (2) v (1) 8	8·7
13	4072	90	Bh	6 (1) v (2) 8	8·6
13	4072	40	Hw	=8	8·8
14	4073	33	Ha	6 (1) v (2) 8	8·6
16	4075	62	Wf	6−4, =8	8·9
17	4076	45	Br	6+1	8·4
17	4076	100	Lp	=7, =8	8·7*b*
19	4078	33	Ha	6 (1) v (2) 8	8·6
22	4081	50	Bn	8 (3) v (1) h	9·1
22	4081	34	Sa	=6	8·5*b*
23	4082	55	Bg	6 (3) v (1) 8	8·7
23	4082	33	Ha	=6	8·5*b*
23	4082	40	Hw	=6	8·5
23	4082	100	Lp	7 (1) v (2) 9	8·9*b*
23	4082	31	D	8−2, h+3	9·0
23	4082	34	Li	=6	8·5
24	4083	90	Bh	6 (2) v (1) 8	8·7
26	4085	33	Ha	8 (1) v (2) 9	9·1
29	4088	32	Ca	7 (2) v (2) 8	8·7
30	4089	33	Ha	6 (1) v (2) 8	8·6
31	4090	45	Bh	8 (1) v (2) 9	9·1*b*
Nov					
2	4092	,,	,,	8 (1) v (1) 9	9·3
3	4093	50	Bn	8 (2) v (1) h	9·1

July 11, Ma, Reddish.

(4557) S URSÆ MAJORIS—*continued.*

1924					
Nov					
3	4093	34	Sa	7−3, =6, 8+1	8·7
3	4093	45	Br	6−2, 8+1	8·7
3	4093	31	D	h−2, 9+3	9·4
4	4094	22	Ni	8 (6) v (1·5) 9	9·6
4	4094	75	Lp	8−5	9·3*b*
4	4094	40	Hw	=8	8·8*b*
4	4094	33	Ha	8 (1) v (4) 9	9·0
5	4095	45	Bh	6−10, 9+1	9·6
8	4098	90	,,	9+2	9·5
8	4098	68	Ha	8 (2) v (3) 9	9·2
10	4100	90	Bh	=9	9·7
15	4105	,,	,,	=9, 13+3	9·8
16	4106	68	Ha	8 (3) v (2) 9	9·4
17	4107	50	Bn	h (4) v (1) 9	9·6
17	4107	34	Sa	=13	10·1*b*
17	4107	,,	Li	8 (3) v (7) 9	9·1
20	4110	90	Bh	9 (1) v (1) 13	9·9
22	4112	32	Ca	8 (7) v (2) 9	9·5
23	4113	94	Ni	=13	10·1
27	4117	90	Bh	=13	10·1
27	4117	40	Hw	=9	9·7
27	4117	50	Bn	9 (2) v (1) 10	9·8
30	4120	60	D	13−1, 16+5	10·2
30	4120	34	Li*	9 (5) v (5) 10	9·8
Dec					
2	4122	90	Bh	13−1	10·2
3	4123	32	Ca	10 (2) v (1) 13	10·0
4	4124	45	Bh	13 (1) v (1) 16	10·4
1924					
Dec					
6	4126	50	Bn	11 (2) v (1) 14	10
6	4126	68	Ha	14 (1) v (2) 16	10
9	4129	34	Li	=12	10
9	4129	90	Bh	13 (2) v (1) 16	10
14	4134	45	,,	=16	10
14	4134	120	Bn	14 (2) v (1) 19	10
14	4134	68	Ha	13 (4) v (1) 18	10
14	4134	90	Sa	=19, =22	11
15	4135	94	Li	=16	10
19	4139	45	Bh	16 (1) v (1) 19	10
22	4142	90	,,	19+2	10
22	4142	75	Bg	19 (1) v (1) 22	11
22	4142	40	Hw	16 (5) 19 (5) v	11
22	4142	60	D	16−3, 22+2	10
23	4143	94	Ni	16 (6) v (1) 22	11
24	4144	32	Ca	16 (1) v (2) 19	10
25	4145	90	Bh	19+1	10
25	4145	60	D	16−2, 22+2	10
26	4146	120	Bn	22 (1) v (3) 23	11
27	4147	90	Sa	=23	11
28	4148	68	Ha	22 (2) v (3) 26	11
30	4150	94	Ni	22 (3) v (3) 23	11
30	4150	90	Bh	=19	10
30	4150	100	Lp	=23	11
30	4150	120	Bn	22 (1) v (1) 23	11

Dec. 15, Difficult.

(4511) T URSÆ MAJORIS. (V. 3.)

H.D. 123160.

Hagen's [6+15] combined = $8^{m}\cdot69$.

Date.	Julian Date.	Inst.	Observer.	Comparisons.	Deduced Mag.
1920					
Jan					
1	2325	45	Br	7−4	9·6
1	2325	60	Tn	=9	9·9*b*
1	2325	23	Bo	8 (3) v (1) 9	9·7
8	2332	70	,,	=9	9·9
8	2332	62	Th	9 (4) v (6) 13	10·2*b*
8	2332	55	Bg	9−3, 11+1	10·2
9	2333	94	Ni	9 (2) v (2) 11	10·1
13	2337	45	Br	11+1	10·2
13	2337	90	Wh	=13	10·8
14	2338	55	Bo	9 (3) v (1) 11	10·2
15	2339	30	Tn	9 (5) v (5) 14	10·1*b*
16	2340	55	Bg	=13	10·7
19	2343	75	Bn	13 (1) v (4) 17	10·9
19	2343	62	Th	=13	10·8
21	2345	60	D	13−4, 17+1	11·2*b*
21	2345	50	Bn	13 (1) v (3) 17	10·9
21	2345	55	Bg	13−1, 17+4	10·9*b*
21	2345	,,	Bo	9 (3) v (1) 11	10·2
21	2345	60	Ga	=13, =14	10·6*b*
23	2347	30	D	=13	10·8*b*
1920					
Jan					
24	2348	50	Bn	13 (2) v (1) 17	11
24	2348	90	Wh	20+5	11
26	2350	55	Bo	14 (3) v (1) 17	11
26	2350	45	Br	11−5, 17+5	10
30	2354	60	Tn	=17	11
31	2355	62	Th	17−2	11
31	2355	55	Bg	17−2, 18+3	11
Feb					
1	2356	,,	Bo	17 (3) v (1) 18	11
6	2361	,,	,,	=18	11
6	2361	94	Ni	17−5, 20+5, 21+5	11
7	2362	45	Br	18−1, 20+4	11
7	2362	55	Bg	18−1, 20+4	11
8	2363	120	Bn	18−3, 20+2	12
8	2363	60	Tn	=18	11
8	2363	90	Wh	=20	12
11	2366	157	Th	=20	12
11	2366	55	Bo	18 (1) v (3) 19	11
15	2370	,,	,,	20 (3) v (1) 21	12
15	2370	60	Tn	=20	12
15	2370	94	Ni	17−7, 20+2, 21+2	12
17	2372	120	Bn	20 (3) v (1) 21	12
18	2373	55	Bg	20−1, =21	12
19	2374	,,	Bo	20 (3) v (1) 21	12

Jan. 21, D, Difficult. Ga, t.
Jan. 23, About.

(4511) T URSÆ MAJORIS—*continued.*

1920					
Feb					
19	2374	94	Ni	20−2, 21−1	12·5
21	2376	150	Tn	=21	12·4*b*
21	2376	120	Br	20−2	12·5
22	2377	55	Bo	21 (1) v (3) 23	12·4*b*
23	2378	,,	,,	22 (3) v (1) 23	12·5
27	2382	157	Th	20 (8) v (2) 27	12·7*b*
28	2383	94	Ni	21 (4) v (4) 25	12·6
28	2383	55	Bo	23 (1) v (1) 24	12·6
Mar					
7	2391	160	Br	27+2	12·6
7	2391	150	Bn	21 (3) v (1) 27	12·7
7	2391	,,	Th	21 (5) v (5) 27	12·6
8	2392	130	Bo	26 (1) v (3) 27	12·8
9	2393	157	Th	27+4	12·4*b*
10	2394	150	Tn	21 (8) v (2) 27	12·7
12	2396	55	Bo	24 (1) v (1) 27	12·8
12	2396	75	Bg	24−2, =27	12·9
12	2396	150	Bn	21 (5) v (1) 27	12·8
13	2397	,,	Tn	21 (8) v (2) 27	12·7
15	2399	,,	,,	21 (8) v (2) 27	12·7
15	2399	94	Ni	27−3	13·1*b*
16	2400	130	Bo	26 (3) v (1) 27	12·8
18	2402	120	Br	27−2	13·0
18	2402	150	Bn	21 (5) v (1) 27	12·8
18	2402	157	Th	27+2	12·6
18	2402	...	Tn	27+2	12·6
19	2403	160	Bo	26 (3) v (1) 27	12·8
22	2406	120	Bn	=27	12·8*b*
23	2407	55	Bg	<24	<12·7*b*
25	2409	160	Bo	=29	13·0
28	2412	94	Ni	29−2	13·2*b*
30	2414	130	Bo	28 (3) v (1) 29	13·0
Apr					
6	2421	160	Bo	=29	13·0*b*
13	2428	,,	,,	28 (1) v (1) 29	13·0
16	2431	94	Ni	29 (2) v (4) y	13·2
17	2432	120	Br	27−1, 29+1	12·9
21	2436	75	Bg	<24	<12·7*b*
21	2436	90	Wh	=27	12·8
27	2442	120	Br	27−2	13·0*b*
May					
7	2452	,,	Bn	27−2	13·0*b*
9	2454	160	Br	=27	12·8*b*
9	2454	94	Ni	27 (3) v (1) 29	13·0
13	2458	120	Bn	27−1	12·9*b*
16	2461	94	Ni	25 (2) v (2) 27	12·8*b*
19	2464	55	Bg	18−4, 21+2	12·2*b*
19	2464	120	Bn	27−1	12·9
22	2467	,,	Br	20−3, 27+3	12·6
22	2467	94	Ni	21 (6) v (1·5) 25	12·7
23	2468	120	Bn	21−3, 27+1·5	12·7
28	2473	94	Ni	21 (3) v (3) 25	12·6
June					
4	2480	90	Wh	<20	<12·3
5	2481	120	Br	20+4	11·9
5	2481	,,	Bn	20+2	12·1
8	2484	94	Ni	17−2, 20+2, 21+4	11·8
9	2485	50	Bn	17 (3) v (1) 18	11·6
19	2495	,,	,,	11 (1) v (2) 13	10·4
19	2495	45	Br	11−3	10·6*b*
22	2498	30	D	14−3, 13+1	10·7*b*

Mar. 18, Tn, 12½-in. mirror.
Mar. 23, Difficult.
April 27, About. Difficult.
May 9, Br, About.
June 4, Invisible.

1920					
June					
23	2499	55	Bg	9−1, 11+3	10·0
29	2505	45	Br	7−3, 9+3	9·5
30	2506	30	D	7−4, 9+3	9·6*b*
July					
3	2509	55	Bg	4−4·5, 5+1·5	8·8*b*
8	2514	30	D	6−1, 7+3	8·9
8	2514	22	Ni	4 (3) v (3) 7	8·8
9	2515	,,	,,	4 (3) v (4) 7	8·7
9	2515	30	D	=6, 6+0·5	8·8
11	2517	,,	,,	4−3, 6+1	8·7*b*
13	2519	55	Bg	2−2, 4+1	8·2*b*
14	2520	22	Ni	2 (5) v (2) 4	8·2
15	2521	50	Bn	2 (2) v (1) 4	8·2
16	2522	30	D	2−3, 4+1	8·3
17	2523	45	Br	4+1	8·2
18	2524	50	Bn	2 (2) v (1) 4	8·2
18	2524	30	D	2−2, 4+1	8·2
18	2524	50	Ma	=4, 6+2	8·5
18	2524	40	Wh	=4	8·3
19	2525	22	Ni	2 (5) v (2) 4	8·2
22	2528	30	D	2−4, 4+1	8·3
24	2530	50	Bn	2 (2) v (1) 4	8·2
24	2530	,,	Ma	4 (1) v (4) 5, 6+3	8·5
27	2533	,,	,,	4+1·5, 6+5	8·3
27	2533	22	Ni	2 (4) v (1) 4	8·3
30	2536	45	Br	4−1	8·4
Aug					
1	2538	30	D	2−3, 4+1	8·3*b*
1	2538	50	Ma	4+1, 6+6	8·2
3	2540	22	Ni	2 (4) v (2) 4	8·2
5	2542	48	Bg	4−1·5, 5+4·5	8·5*b*
5	2542	50	Ma	5+1, 6+2·5	8·7
7	2544	,,	,,	6+2	8·6
8	2545	90	Wh	=4	8·3
8	2545	30	D	4−1, 6+3	8·5*b*
9	2546	50	Ma	5+1, 6+2·5	8·7
9	2546	30	Bn	2 (2) v (1) 4	8·2
14	2551	,,	,,	2 (2) v (1) 4	8·2
15	2552	50	Ma	5+1, 6+2	8·8
16	2553	23	Bo	4 (1) v (2) 6	8·5*b*
16	2553	30	D	4−3, 6+3	8·6
20	2557	,,	Bn	4−1	8·4
22	2559	50	Ma	5+1, 6+1·5	8·8
26	2563	,,	,,	5+2, 6+4	8·6
26	2563	30	Bn	4 (2) v (1) [6+15]	8·6
26	2563	90	Wh	=5	9·0
28	2565	48	Bg	4−4, 5+2·5	8·7
30	2567	30	Bn	4 (3) v (1) [6+15]	8·6
Sept					
4	2572	50	Ma	=6	8·8
5	2573	75	Bn	6 (2) v (1) 7	9·1
6	2574	50	Ma	6+1	8·7
6	2574	30	Tn	4 (8) v (2) 5	8·8
7	2575	,,	Bn	[6+15] (2) v (1) 7	9·0
8	2576	90	Wh	5 (1) v (2) 9	9·3
8	2576	30	Tn	=5	9·0
8	2576	55	Bo	4 (3) v (1) 5	8·8
9	2577	22	Ni	4 (5) v (2·5) 7	8·9
10	2578	45	Br	=5, =6	8·9
10	2578	75	Bn	6 (5) v (2) 7	9·1
12	2580	23	Bo	5 (1) v (4) 7	9·0
12	2580	30	D	6−2, 7+1	9·1
13	2581	50	Ma	=5, 6−2	9·0

June 30, Difficult.
July 18, Ma, About.
Aug. 15, Pale yellow.

(4511) T URSÆ MAJORIS—*continued.*

1920 Sept					
13	2581	30	Tn	5 (2) v (8) 9, 5−2	9·1
15	2583	,,	,,	=7	9·2
16	2584	22	Ni	7 (1·5) v (4·5) 9	9·3
16	2584	50	Ma	5−4	9·4*b*
18	2586	,,	Bn	7−1	9·3
19	2587	55	Bo	7 (3) v (1) 8	9·3
19	2587	,,	Bg	8−2, 9+4	9·5
19	2587	90	Wh	5 (1) v (1) 9	9·4*b*
19	2587	30	Tn	5 (7) v (3) 9	9·6
21	2589	,,	,,	5 (7) v (3) 9	9·6
24	2592	,,	,,	5 (7) v (3) 9	9·6*b*
25	2593	45	Br	7−3, 9+2	9·6
26	2594	50	Ma	6−5, 9+2	9·5
27	2595	,,	Bn	7 (2) v (1) 9	9·6
29	2597	55	Bo	9 (1) v (3) 11	10·0
30	2598	30	Tn	=9	9·9*b*
Oct					
1	2599	94	Ni	7 (8) v (2) 9	9·7
2	2600	50	Bn	9−0·5	9·9
4	2602	55	Bo	9 (1) v (3) 11	10·0
6	2604	50	Ma	9−2, 11+2·5, 13+2·5	10·2
6	2604	55	Bg	9−4·5, 14+1	10·3*b*
8	2606	50	Bn	9 (1) v (1) 14	10·1*b*
8	2606	94	Ni	11+1	10·2
9	2607	30	D	14+2	10·2
9	2607	55	Bo	=11	10·3
11	2609	50	Bn	9 (3) v (1) 14	10·3
13	2611	79	Ma	11 (1) v (1) 18, 13+1	10·9
14	2612	55	Bo	14 (1) v (7) 16	10·5
18	2616	79	Ma	11 (3) v (1) 18	11·4
18	2616	45	Br	11−2	10·5
18	2616	50	Bn	9 (3) v (1) 14	10·3
19	2617	55	Bo	14 (3) v (1) 16	10·9
19	2617	94	Ni	11 (4) v (3) 14	10·4
20	2618	55	Bg	13−2, 17+3	11·0*b*
25	2623	50	Bn	13 (3) v (2) 17	11·1
25	2623	30	Tn	17+1	11·2*b*
26	2624	,,	,,	11 (5) v (5) 17	10·8*b*
30	2628	55	Bo	16 (3) v (1) 17	11·2
Nov					
1	2630	94	Ni	=17	11·3
1	2630	120	Bn	=17	11·3
5	2634	160	Br	17−1	11·4
7	2636	130	Bo	18 (3) v (1) 19	11·8
16	2645	94	Ni	17−6, 20+2, 21+3	12·0
16	2645	160	Bo	18 (3) v (1) 20	12·1
18	2647	55	Bg	=18	11·7*c*
18	2647	120	Br	20+1	12·2*b*
21	2650	50	Bn	18 (2) v (1) 20	12·1
22	2651	55	Bo	20 (3) v (1) 21	12·4
Dec					
1	2660	120	Br	20−3	12·6
3	2662	150	Tn	18 (5) v (5) 21	12·1
4	2663	94	Ni	20−3, 21−5, 25+3	12·6
14	2673	150	Tn	=21	12·4
30	2689	55	Bg	=21	12·4*b*
31	2690	120	Br	20−4	12·7
1921 Jan					
1	2691	150	Tn	20 (5) v (5) 27	12·6*b*
4	2694	,,	,,	=21	12·4*b*
6	2696	,,	,,	20 (5) v (5) 27	12·6
9	2699	94	Ni	21 (2) v (4) 25, 20 (1) v (4) 25	
13	2703	150	Tn	=21	
14	2704	160	Bo	20 (1) v (3) 21	
15	2705	120	Br	20+1	
16	2706	94	Ni	17 (5) v (2) 20, 17 (5) v (3) 21	
22	2712	,,	,,	17 (4) v (3) 20, 17 (4) v (4) 21	
26	2716	150	Tn	=18	
27	2717	55	Bo	16 (3) v (1) 17	
28	2718	50	Bn	13 (5) v (2) 17	
31	2721	120	,,	13 (5) v (1) 17	
31	2721	55	Bo	16 (4) v (1) 17	
Feb					
2	2723	50	Bn	13−3·5, 17+2	
3	2724	45	Br	11−7, 17+2	
5	2726	55	Bo	16 (1) v (2) 17	
5	2726	79	Ma	14 (1) v (1) 13	
8	2729	60	Tn	11−1	
9	2730	50	Ma	14+1	
10	2731	60	Tn	=14	
11	2732	,,	,,	9 (7) v (3) 14	
12	2733	94	Ni	9 (6) v (2) 11	
14	2735	50	Ma	4 (6) v (1) 9, 9+1	
14	2735	32	Ca	9−1·5, 14+4	
14	2735	50	Bn	11 (2) v (1) 14	
17	2738	60	Tn	9 (5) v (5) 14	
17	2738	45	Br	=9	
19	2740	22	Ni	9−1	
19	2740	55	Bo	8 (3) v (1) 9, 9 (1) v (3) 11	
20	2741	50	Bn	7 (4) v (1) 9	
21	2742	30	Tn	5 (7) v (3) 9	
24	2745	55	Bo	7 (1) v (3) 8	
24	2745	,,	Bg	7−1, 9+6	
24	2745	50	Bn	7 (2) v (3) 9	
25	2746	30	Tn	=5	
26	2747	50	Bn	6 (4) v (1) 7	
26	2747	22	Ni	4 (5) v (2) 7	
27	2748	55	Bo	6 (1) v (3) 5	
27	2748	50	Ma	4 (4) v (1) 9	
28	2749	32	Ca	6−4, =7, 10+3	
Mar					
1	2750	50	Bn	6 (1) v (1) 7	
2	2751	55	Bo	4 (2) v (1) 6	
2	2751	,,	Bg	4−2, 5+4	
2	2751	30	Tn	4 (7) v (3) 5	
7	2756	50	Bn	2 (3) v (1) 4	
8	2757	55	Bo	2 (1) v (1) 4	
9	2758	,,	Bg	2−1, 4+2	
10	2759	,,	Bo	d (3) v (1) 2	
10	2759	45	Br	=2	
10	2759	50	Bn	2 (1) v (1) 4	
10	2759	22	Ni	2 (0·5) v (5) 4	
11	2760	55	Bg	=2	
15	2764	F	Bo	c (3) v (1) d	
18	2767	,,	Bg	b−1, c+2	
18	2767	50	Bn	c−4, 2+3	
20	2769	45	Br	2+6	
21	2770	F	Bo	b (1) v (1) c	
24	2773	,,	Bg	1−4·5, b+1	
24	2773	25	Bn	b (2) v (1) c	
24	2773	22	Ni	b+2	
26	2775	32	Ca	b+1	
27	2776	25	Bn	b (3) v (1) c	
29	2778	22	Ni	b+3	
30	2779	25	Bn	b (2) v (1) c	

Oct. 1, With 22, 10·0.
Oct. 8, Ni, With 22, 10·4.
Nov. 18, Bg, About.
Dec. 30, About.

(4511) T URSÆ MAJORIS—*continued.*

1921					
Mar					
30	2779	F	Bg	1−4, b+1·5	6·8
30	2779	,,	Bo	1 (4) v (1) b	6·9
Apr					
1	2781	,,	Bg	1−4, b+1·5	6·8
2	2782	45	Br	2+8	7·2
2	2782	F	Bo	1 (3) v (1) b	6·8
3	2783	32	Ca	b+1·5	6·8
4	2784	30	Bn	b (2) v (1) c	7·2
4	2784	,,	D	1−3, b+2	6·7*b*
6	2786	,,	Bn	b (2) v (1) c	7·2
7	2787	F	Bo	1 (2) v (1) b	6·8
7	2787	,,	Bg	1−4, b+1·5	6·8
7	2787	30	Tn	1 (5) v (5) 2	7·2*b*
9	2789	22	Ni	b+2	6·8
10	2790	30	Tn	1 (5) v (5) 2	7·2
12	2792	F	Bo	1 (1) v (1) b	6·7
12	2792	30	Bn	b (2) v (1) c	7·2
14	2794	F	Bg	=b	7·0*b*
15	2795	45	Br	2+5	7·5
15	2795	30	D	a−5, b+0·5	6·9
15	2795	,,	Tn	1 (7) v (3) 2	7·5
17	2797	32	Ca	b+3	6·7
18	2798	30	Tn	1 (7) v (3) 2	7·5
18	2798	F	Bo	b (1) v (1) c	7·1*b*
23	2803	30	Bn	c (1) v (1) d	7·4
26	2806	32	Ca	b−2, =c	7·2
27	2807	22	Ni	=b	7·0*b*
27	2807	30	D	c−1, 2+5	7·5
27	2807	,,	Bn	c (2) v (1) d	7·5
27	2807	B	Bg	c−1, d+2	7·4
28	2808	F	Bo	b (1) v (1) c	7·1*b*
29	2809	,,	Bg	=c	7·3
29	2809	45	Br	2+2	7·8
May					
1	2811	30	Bn	=d	7·6
8	2818	50	,,	2+2	7·8
8	2818	F	Bg	d−2, 2+2	7·8
8	2818	45	Br	2+2	7·8
10	2820	55	Bo	2+2	7·8
11	2821	22	Ni	2+1	7·9
16	2826	30	D	2−3, 4+1	8·3*b*
19	2829	50	Bn	2 (1) v (2) 4	8·1
19	2829	55	Bg	2−2, 4+1	8·2
20	2830	,,	Bo	2+1	7·9
22	2832	50	Bn	4 (1) v (5) 6	8·4
24	2834	22	Ni	2 (6) v (2) 4	8·3
28	2838	55	Bg	4−3·5, 5+3	8·7
29	2839	32	Ca	6−2, 7+2	9·0*b*
29	2839	30	D	6−1, 7+4	8·9
29	2839	22	Ni	4 (1·5) v (4) 7	8·6
June					
1	2842	,,	,,	4 (4·5) v (2·5) 7	8·9
1	2842	55	Bo	4 (1) v (2) 5	8·5
2	2843	45	Br	=6	8·8
2	2843	55	Bg	=5	9·0
5	2846	30	D	6−3, 7+1	9·1
6	2847	50	Bn	6 (5) v (2) 7	9·1
9	2850	55	Bg	7−1, =8, 9+5	9·3
11	2852	75	Bn	7 (1) v (1) 9	9·5
11	2852	50	Ma	14+1	10·3
14	2855	55	Bo	8 (1) v (3) 9	9·4
15	2856	,,	Bg	8−4, 9+1	9·7
15	2856	50	Bn	7 (3) v (1) 9	9·7

April 2, Br, About.
April 4, 27, D, Difficult.
May 8, Bg, With 55, 7·9.

1921					
June					
16	2857	30	D	7−5, 9+2	9·7*b*
22	2863	55	Bg	=11	10·3*b*
23	2864	75	Bn	11 (1) v (1) 13	10·5
24	2865	94	Ni	11+0·5	10·2
28	2869	32	Ca	=13	10·8*b*
28	2869	50	Bn	9 (5) v (1) 14	10·3
30	2871	55	Bg	=13	10·8*b*
July					
4	2875	94	Ni	14 (2) v (3) 17	10·7
5	2876	50	Bn	13 (1) v (1) 17	11·0
5	2876	,,	Ma	=18	11·7
7	2878	55	Bg	13−3, 17+2	11·1
7	2878	160	Br	=17	11·3
9	2880	50	Bn	13 (4) v (1) 17	11·2
9	2880	60	D	17+1·5	11·1
9	2880	94	Ni	17−1	11·4*b*
21	2892	50	Ma	<13	<10·8*b*
25	2896	120	Bn	17 (3) v (2) 20	11·9
Aug					
3	2905	183	Ma	20−2	12·5*b*
9	2911	85	Bn	<18	<11·7
9	2911	183	Ma	20−5	12·8*c*
26	2928	160	Bo	27 (1) v (1) 28	12·9*b*
26	2928	94	Ni	27 (2) v (2) 29	12·9*b*
30	2932	,,	,,	=29	13·0
30	2932	120	Br	27−3	13·1*b*
31	2933	160	Bo	<21	<12·4
Sept					
3	2936	75	Bn	<21	<12·4
5	2938	160	Bo	28 (1) v (1) 29	13·0*b*
5	2938	120	Br	27−3	13·1
6	2939	94	Ni	27−5, =29	13·2
20	2953	120	Br	27−5	13·3
23	2956	94	Ni	y−2	13·8*b*
23	2956	160	Bo	<21	<12·4
24	2957	120	Bn	21−5	12·9*b*
26	2959	160	Bo	<21	<12·4
28	2961	55	Bg	18−4, 21+2	12·2*b*
29	2962	120	Bn	<21	<12·4
29	2962	94	Ni	29−3	13·3
Oct					
1	2964	160	Bo	<21	<12·4
4	2967	120	Bn	27−1	12·9*b*
7	2970	140	Bo	21 (3) v (1) 27	12·7*b*
9	2972	94	Ni	27 (5) v (1) 29	13·0
14	2977	120	Br	<21	<12·4*b*
19	2982	150	Tn	<21	<12·4*b*
23	2986	,,	,,	<21	<12·4
23	2986	120	Bn	=27	12·8*b*
23	2986	160	Br	27−3	13·1
25	2988	120	,,	27−3	13·1
30	2993	140	Bo	20 (1) v (1) 21	12·3*c*
Nov					
2	2996	94	Ni	20 (8) v (4) 27, 21 (8) v (2) 25	12·7
6	3000	150	Tn	21−2	12·6
7	3001	,,	,,	=21	12·4*b*
7	3001	120	Br	20+1	12·2

July 5, Ma, ±.
July 21, Sept. 3, Oct. 14, Not seen.
Aug. 9, Bn, Not seen.
Aug. 30, Br, Difficult.
Sept. 5, Br, Or less.
Sept. 28, Difficult.
Sept. 29, Bn, Seen, but could not estimate.
Oct. 19, 23, Tn, Invisible.

(4511) T URSÆ MAJORIS—*continued.*

1921 Nov					
19	3013	55	Bo	9 (3) v (2) 11	10·1*b*
22	3016	,,	,,	9 (1) v (2) 11	10·0
22	3016	94	Ni	9 (4) v (2) 11	10·1
23	3017	55	Bg	9−2, 14+4	10·0
23	3017	50	Bn	7 (5) v (1) 9	9·7
24	3018	30	D	=14	10·4
24	3018	22	Ni	9 (3) v (1·5) 11	10·1
25	3019	55	Bo	8 (5) v (1) 9	9·8
26	3020	50	Bn	9+2	9·7
30	3024	22	Ni	7 (3) v (1) 9	9·7
Dec					
2	3026	,,	,,	7 (4) v (3) 9	9·6
3	3027	30	Tn	7 (7) v (3) 9	9·6
3	3027	45	Br	7−2, 9+4	9·4
4	3028	50	Bn	7 (2) v (1) 9	9·6
7	3031	55	Bg	=7	9·2*b*
13	3037	50	Bn	6−1, 7+2	9·0*b*
17	3041	55	Bg	=5	9·0*b*
17	3041	,,	Bo	4 (2) v (3) 6	8·5
20	3044	50	Bn	=6	8·8*b*
23	3047	45	Br	=4	8·3
25	3049	75	Bn	4 (2) v (1) 6	8·7
25	3049	22	Ni	4 (1·5) v (6) 7	8·5
26	3050	55	Bo	4 (1) v (1) 6	8·6
28	3052	22	Ni	4 (2·5) v (4) 7	8·7
28	3052	55	Bg	=5	9·0
28	3052	75	Bn	4 (3) v (1) 6	8·7
31	3055	,,	,,	4 (2) v (1) 6	8·7
1922 Jan					
2	3057	...	Sa	2−5, 4−3, 6+1, 7+2, 9+10	8·7
3	3058	45	Br	4−2, 6+4	8·5
3	3058	75	Bn	4 (3) v (1) 6	8·7
6	3061	55	Bo	4 (3) v (2) 6	8·6
6	3061	22	Ni	4 (4·5) v (3·5) 7	8·8
10	3065	75	Bn	6 (1) v (3) 7	8·9
12	3067	55	Bo	4 (3) v (1·5) 6	8·7
16	3071	,,	,,	4 (4) v (1) 6	8·7
16	3071	,,	Bg	5−0·5, 7+1	9·0*b*
16	3071	75	Bn	6 (1) v (2) 7	9·0*b*
19	3074	22	Ni	4 (6) v (1·5) 7	9·0
22	3077	45	Br	=7	9·2
30	3085	55	Bo	7 (2) v (2) 10	9·3
Feb					
1	3087	,,	Bg	7−4, 9+3	9·6
5	3091	,,	Bo	7 (2) v (2) 10	9·3
8	3094	,,	,,	7 (2) v (1) 10	9·4
9	3095	50	Bn	=9	9·9
10	3096	94	Ni	=9	9·9*b*
13	3099	90	Wh	=9	9·9
13	3099	50	Bn	9 (1) v (2) 11	10·0
14	3100	55	Bo	10 (2) v (1) 9	9·7
17	3103	...	Sa	7−10, 9−5, 14+3, 13+5	10·2
17	3103	50	Bn	11+1	10·2
17	3103	45	Br	7−4, 11+8	9·5
18	3104	55	Bo	9 (2) v (3) 11	10·0
18	3104	,,	Bg	9−5, 14+1	10·3
18	3104	32	Ca	9−4, =11	10·3
19	3105	79	Ma	9 (1) v (1) 14	10·1
21	3107	...	Sa	9−10, 14−2, 13+2, 17+10	10·7
24	3110	50	Bn	11 (2) v (1) 13	10·6
24	3110	,,	Ma	9 (2) v (1) 14	10·2

Nov. 22, Ni, With 22, 10·2.

1922 Feb					
25	3111	55	Bo	9 (3) v (2) 11	
25	3111	,,	Bg	14−1, 13+3	
25	3111	94	Ni	11 (2) v (1) 14	
26	3112	50	Bn	11−4, 13+1	
Mar					
2	3116	,,	,,	13 (1) v (1) 17	
2	3116	55	Bo	14 (2) v (2) 13	
4	3118	,,	Bg	13−4, 17+1	
4	3118	45	Br	11−4	
7	3121	50	Bn	17 (1) v (3) 18	
8	3122	55	Bo	16 (1) v (2) 17	
8	3122	...	Sa	9−12, 14−6, 13−3, 18+3, 20+5, 21+10	
16	3130	55	Bo	17 (2) v (3) 18	
16	3130	80	Ca	19−1, 20+2	
18	3132	94	Ni	17 (7) v (3) 20, 17 (7) v (4) 21	
20	3134	130	Ma	20+0·5	
20	3134	120	Bn	18 (3) v (1) 20	
22	3136	,,	Br	20+2	
23	3137	55	Bo	20 (1) v (1) 21	
25	3139	120	Bn	20 (2) v (1) 21	
31	3145	94	Ni	20 (6) v (3) 25	
Apr					
1	3146	120	Bn	21+1	
2	3147	55	Bg	21−2, 24+1	
16	3161	140	Bo	27+1	
19	3164	75	Bg	24−2, =27	
19	3164	94	Ni	=29	
20	3165	140	Bo	25 (1) v (1) 27	
29	3174	120	Br	27−3, =29	
May					
4	3179	140	Bo	<27	<
13	3188	120	Br	<27	<
14	3189	140	Bo	28 (1) v (1) 29	
14	3189	55	Bg	24−2, =28	
14	3189	120	Bn	27−2	
19	3194	,,	,,	<27	<
20	3195	140	Bo	28 (1) v (1) 29	
21	3196	94	Ni	29 (2) v (3) y	
21	3196	75	Bg	=28	
23	3198	240	Br	=29	
25	3200	120	,,	29−1	
27	3202	140	Bo	28 (1) v (1) 29	
27	3202	50	Bn	27−2	
27	3202	94	Ni	27 (4) v (1) 29	
June					
1	3207	,,	,,	27 (4) v (1) 29	
17	3223	157	Wf	21−4, 28+1	
18	3224	150	,,	21−4, 27+2	
19	3225	140	Bo	21−3	
24	3230	79	Ma	20−2	
26	3232	150	Wf	20−4, 21−3, 27+3	
July					
10	3246	120	Br	20+2	
12	3248	94	Ni	17 (6) v (4) 20, 17 (6) v (4) 21	
15	3251	80	Ca	17−3, 18+2	
18	3254	79	Ma	20+3	
18	3254	120	Bn	17 (1) v (1) 18	
19	3255	140	Bo	13 (2) v (2) 17	
20	3256	55	Bg	=17	

May 13, Doubtfully seen.
May 14, Bg, About.
May 19, Not seen.
May 23, About.

(4511) T URSÆ MAJORIS—*continued.*

1922					
July					
21	3257	160	Br	=17	11·3
22	3258	62	Wf	12−3, 13+1, 17+5	10·7
27	3263	32	Ca	10−1, 9+2	9·6
28	3264	50	Bn	7 (3) v (1) 9	9·7
30	3266	120	,,	7 (1) v (2) 9	9·4
30	3266	62	Wf	7−3, 9+4	9·5
31	3267	55	Bo	6 (2) v (1) 7	9·1
31	3267	,,	Bg	5−2, =7, 9+6	9·2
31	3267	50	Ma	6−2, 5−2	9·1
Aug.					
2	3269	45	Br	6−2, 7+2	9·0
7	3274	30	Bn	4 (2) v (1) [6+15]	8·6
7	3274	22	Ni	4 (1·5) v (4) 7	8·6
13	3280	F	Wf	4−2, 6+4	8·5
14	3281	32	Ca	2 (1) v (1) 3	8·1*b*
15	3282	30	Bn	2 (3) v (2) 4	8·2
15	3282	,,	D	2−2, 4+1	8·2*b*
16	3283	55	Bo	2 (2) v (1) 4	8·2
17	3284	,,	Bg	2+2	7·8
17	3284	50	Ma	4−1, 6+5, 5+3	8·5*b*
17	3284	22	Ni	=2	8·0
20	3287	55	Bo	2+2	7·8
20	3287	45	Br	2+1	7·9
20	3287	30	Bn	2 (1) v (2) 4	8·1
20	3287	22	Ni	2 (1) v (5) 4	8·1
21	3288	62	Wf	=2, 4+3	8·0
23	3290	...	Sa	2−2, =4, 6+4, 7+7	8·4
23	3290	B	Bg	d−1, 2+3	7·7
23	3290	30	Bn	2+1	7·9
25	3292	,,	,,	d (3) v (1) 2	7·9
26	3293	B	Bg	=d	7·6
27	3294	22	Ni	c (3) v (1) 2	7·8
30	3297	32	Ca	=2, 3+2	8·0
31	3298	30	Bn	d (3) v (2) 2	7·8
Sept.					
7	3305	F	Wf	c−5, =2	7·9*b*
7	3305	13	Bo	d (3) v (1) 2	7·9*b*
9	3307	30	Bn	c (2) v (1) d	7·5
9	3307	32	Ca	=2, 3+2	8·0
10	3308	22	Ni	c (1·5) v (2) 2	7·6
10	3308	B	Bg	d−2, 2+2	7·8*b*
11	3309	...	Sa	2−1, 4+3, 6+7, 7+10	8·1
13	3311	F	Wf	2−1, 4+3	8·1
15	3313	45	Br	2+2	7·8
16	3314	62	Wf	2−2, 4+1, 6+6	8·2
17	3315	B	Bg	d−1, 2+3	7·7
18	3316	22	Ni	c (3) v (2) 2	7·7
20	3318	48	Bg	=2	8·0
20	3318	25	Bn	d (1) v (2) 2	7·7
21	3319	13	Bo	2 (1) v (3) 4	8·1*b*
22	3320	...	Sa	=2, 4+2, 6+6	8·1
23	3321	F	Wf	2−1, =4	8·2
24	3322	30	Bn	d (2) v (1) 2	7·9
26	3324	50	Ma	=4, 6+4	8·4
29	3327	55	Bg	2+1	7·9*b*
29	3327	30	Bn	2 (2) v (1) 4	8·2
Oct.					
1	3329	45	Br	2+1	7·9
1	3329	...	Sa	2−4, 4−1, 6+6	8·4
4	3332	...	,,	2−2, 4+2, 6+6, 7+10	8·2
6	3334	50	Bn	4−1	8·4
1922					
Oct.					
8	3336	62	Wf	4+1	8·2
11	3339	55	Bg	4−1, 5+5	8·5*b*
12	3340	50	Bn	4 (1) v (1) 6	8·6
13	3341	55	Bo	4 (2) v (2) 5	8·7
13	3341	34	Li	=4	8·3*b*
13	3341	22	Ni	4 (3) v (3) 7	8·8
14	3342	...	Sa	2−8, 4−4, 6+2, 7+6	8·7
15	3343	62	Wf	4−5, 7+2	8·9
15	3343	50	Bn	4 (2) v (1) 6	8·7
15	3343	34	Li	4 (5) v (5) 5	8·7
16	3344	,,	,,	4 (3) v (7) 5	8·5
18	3346	22	Ni	4 (6) v (2) 7	9·0
21	3349	45	Br	=5, =6	8·9
22	3350	50	Bn	6 (2) v (3) 7	9·0
22	3350	37	Lp	5 (2) v (2) 7	9·1
24	3352	,,	,,	5 (2) v (2) 7	9·1
24	3352	22	Ni	4 (6) v (1) 7	9·1
27	3355	50	Bn	7−1	9·3
28	3356	...	Sa	4−12, 6−6, 7−3, 9+2	9·5
28	3356	34	Li	=7	9·2
28	3356	37	Lp	=9	9·9
28	3356	55	Bo	7 (1) v (1) 8	9·2
31	3359	32	Ca	8 (1) v (5) 9, 9+5	9·4
Nov.					
1	3360	55	Bg	7−3, 9+3	9·5*b*
1	3360	37	Lp	=9	9·9*b*
1	3360	34	Li	7 (6) v (4) 8	9·2
1	3360	...	Sa	4−12, 6−6, 7−3, 9+2, 14+10	9·5
1	3360	50	Bn	7 (1) v (2) 9	9·4
4	3363	,,	,,	7 (3) v (1) 9	9·7
4	3363	45	Br	7−3, 9+3	9·5*b*
9	3368	94	Ni	=9	9·9
10	3369	62	Wf	9−2, 11+3	10·0
13	3372	50	Bn	9 (1) v (1) 11	10·1
18	3377	,,	,,	11 (1) v (2) 13	10·4
18	3377	32	Ca	10 (4) v (2) 9	9·7
18	3377	37	Lp	=13	10·8
24	3383	100	,,	11 (2) v (2) 17, =13	10·8
24	3383	45	Br	11−3, 17+6	10·6*b*
24	3383	50	Bn	13 (3) v (1) 17	11·1
26	3385	94	Ni	14 (4) v (2·5) 17	10·9
27	3386	55	Bo	<11	<10·3*c*
Dec.					
11	3400	160	Br	20+4, 21+4	11·9
14	3403	94	Ni	17 (5) v (3) 21	12·0
14	3403	...	Sa	17−3, 21+4	11·8
20	3409	55	Bo	20 (1) v (1) 21	12·3*b*
20	3409	100	Lp	21−1	12·5*b*
23	3412	75	Bg	=21	12·4*b*
26	3415	94	Ni	20 (6) v (2) 25, 21 (5) v (2) 25	12·6
1923					
Jan.					
7	3427	34	Li	<19	<11·9*b*
9	3429	94	Ni	=27	12·8
13	3433	157	Wf	20−5, 27+2	12·7
14	3434	94	Li	<21	<12·4*b*
16	3436	100	Lp	<21	<12·4*b*
18	3438	160	Br	<21	<12·4*b*

Aug. 15, D, 3-in.
Sept. 7, Wf, Same result with 62.

Nov. 26, With 22, 11·0.
Dec. 23, About.
Jan. 9, Approximately.
Jan. 16, 18, Not seen.

(4511) T URSÆ MAJORIS—*continued.*

1923					
Jan					
20	3440	120	Br	27−2	13·0*b*
20	3440	94	Ni	27 (2) v (2) 29	12·9*b*
21	3441	...	Sa	21−4	12·8
23	3443	157	Wf	27−3, 29+1	13·0
24	3444	120	Bn	21−5, 27+1	12·8*b*
Feb					
4	3455	,,	,,	21−5	12·9*b*
5	3456	,,	Br	27−4	13·2
6	3457	94	Ni	27 (3) v (1) 29	13·0*b*
7	3458	157	Wf	29−2	13·2
8	3459	120	Br	27−4	13·2
13	3464	94	Ni	27 (4) v (1) 29	13·0*b*
18	3469	55	Bg	=21	12·4*b*
Mar					
6	3485	120	Bn	27−1	12·9
6	3485	79	Ma	20−8	13·1*b*
12	3491	140	Bo	21 (1) v (3) 25	12·5*b*
17	3496	120	Bn	20−3, 21−2	12·6
17	3496	94	Ni	21 (6) v (2) 25	12·7
18	3497	55	Bo	=21	12·4*b*
24	3503	193	Li	20 (5) v (1) 21	12·3
24	3503	94	Ni	20−3, 21−2	12·6
Apr					
4	3514	,,	,,	17−2, 20+4, 21+5	11·7
4	3514	50	Bn	17 (2) v (1) 18	11·6
4	3514	55	Bo	14 (5) v (2) 17	11·0
6	3516	62	Wf	13−3·5, 17+2	11·1*b*
7	3517	75	Bn	13 (4) v (1) 17	11·2
8	3518	55	Bg	13−5, =17	11·3
9	3519	,,	Bo	11 (1) v (1) 14	10·3
9	3519	75	Bn	13 (2) v (1) 17	11·1
9	3519	22	Ni	11 (4) v (1) 14	10·4
11	3521	32	Ca	17 (2) v (3) 18	11·4
13	3523	75	Bn	14 (1) v (2) 13	10·5
13	3523	37	Lp	9 (2) v (2) 11	10·1
13	3523	34	Li	10 (7) v (3) 12	10·1
13	3523	75	Pr	9−2, 13+5	10·2
14	3524	...	Sa	=14	10·4
14	3524	55	Bg	9−2, 14+3	10·1
14	3524	30	D	9−2, 14+4	10·0
15	3525	62	Wf	=9	9·9*b*
15	3525	22	Ni	9 (4) v (1) 11	10·2
17	3527	32	Ca	10 (1) v (2) 9	9·6
18	3528	55	Bo	8 (1) v (1) 10	9·4*b*
19	3529	,,	Bg	9 (1) v (4) 14	10·0*b*
19	3529	30	D	7−3, 9+4	9·5
19	3529	34	Li	7 (8) v (2) 10	9·4
20	3530	30	Bn	9 (1) v (3) 11	10·0
20	3530	75	Pr	=6, 7+1	9·0*b*
21	3531	32	Ca	=8	9·3
22	3532	22	Ni	7 (2) v (4) 9	9·4
24	3534	75	Bn	6 (3) v (1) 7	9·1
25	3535	32	Ca	6 (2) v (1) 7	9·1
26	3536	75	Bn	6 (3) v (2) 7	9·0
26	3536	34	Li	4 (9) v (1) 5	8·9
27	3537	30	D	6 (5) v (3) 7	9·1
27	3537	45	Br	=5, =6	8·9
28	3538	55	Bo	4 (5) v (1) 5	8·9
28	3538	...	Sa	5−4, 7−3, 9+4	9·4
May					
1	3541	32	Ca	=6, 7+3	8·9
1	3541	75	Pr	6+1, 5+2	8·8*b*

Jan. 20, Br, Difficult.
Feb. 18, About.
Mar. 24, Li, Difficult.
April 13, Pr, Yellow.

1923					
May					
2	3542	30	D	6−2, 7+1	
3	3543	55	Bo	4 (4) v (2) 5	
3	3543	,,	Bg	=5, 7+2	
3	3543	50	Bn	6 (1) v (1) 7	
3	3543	37	Lp	4 (2) v (2) 5	
3	3543	...	Sa	4−3, =6, 7+3	
4	3544	34	Li	4 (9) v (1) 5	
5	3545	22	Ni	4 (5) v (2·5) 7	
6	3546	F	Wf	6−1, 7+3	
8	3548	45	Br	=6	
9	3549	32	Ca	=6, 7+3	
10	3550	30	D	6 (2) v (3) 7	
11	3551	75	Pr	4−4, 5+2	
11	3551	55	Bg	4 (3) v (1) 5	
11	3551	37	Lp	4 (1) v (2) 5	
12	3552	75	Bn	4 (2) v (1) 6	
12	3552	...	Sa	6−4, =5, 7+3	
12	3552	34	Li	4 (7) v (3) 5	
13	3553	30	D	6−1, 7+2	
16	3556	55	Bg	4 (4) v (1) 5	
16	3556	30	Bn	4 (1) v (1) 6	
16	3556	37	Lp	2 (2) v (2) 4	
17	3557	32	Ca	4 (3) v (2) 6	
17	3557	55	Bo	4 (3) v (3) 5	
20	3560	F	Wf	4−5, 6+1	
21	3561	25	Bn	4 (1) v (2) 6	
23	3563	...	Sa	4−2, 6+2	
24	3564	30	D	4−3, 6+2	
24	3564	22	Ni	4 (1) v (7) 7	
25	3565	50	Bn	4 (2) v (1) 6	
25	3565	37	Lp	2 (2) v (2) 4	
27	3567	30	D	4−2, 6+3	
31	3571	32	Ca	4 (3) v (2) 6	
June					
2	3573	34	Li	4 (7) v (3) 5	
2	3573	90	Wh	=5	
3	3574	62	Wf	=4, 6+4	
4	3575	30	D	4−3, 6+2	
10	3581	,,	,,	4−4, 6+1, 7+5	
10	3581	34	Li	4 (6) v (4) 5	
11	3582	50	Bn	=5	
11	3582	32	Ca	6 (1) v (3) 7	
11	3582	...	Sa	4−8, 6+1, 5−1, 7+5	
17	3588	37	Lp	4 (3) v (2) 5	
18	3589	30	D	6 (2) v (3) 7	
18	3589	...	Sa	2−8, =5, 7+4	
22	3593	37	Lp	5 (1) v (2) 8	
22	3593	55	Bg	4 (1) v (4) 5	
23	3594	40	Wh	5 (1) v (1) 9	
23	3594	30	D	6 (3) v (2) 7	
26	3597	,,	,,	6−2, 7+1	
28	3599	62	Wf	6−4, =7, 9+7	
29	3600	30	D	6−3, 7+1	
30	3601	...	Sa	5−4, 7+2, 9+6	
July					
1	3602	30	D	6−3, 7+1	
1	3602	32	Ca	5 (1) v (1) 7	
2	3603	100	Lp	5 (2) v (1) 7	
4	3605	55	Bg	5 (1) v (4) 7	
4	3605	50	Bn	7 (1) v (5) 9	
4	3605	30	D	7−0·5, 9+5	
5	3606	75	Pr	5−2, 6−2, =7	
5	3606	22	Ni	4 (6) v (1·5) 7	
5	3606	37	Lp	7+1	

July 2, Difficult.

(4511) T URSÆ MAJORIS—*continued.*

1923 July					
6	3607	30	D	7−3, 9+5	9·4
7	3608	90	Wh	5 (1) v (1) 9	9·4
8	3609	30	D	7−3, 9+5	9·4
8	3609	...	Sa	5−8, 7−4, 8−3, 9+2	9·6
8	3609	62	Wf	6−5, 9+6	9·3
10	3611	32	Ca	7 (2) v (5) 9	9·4
10	3611	22	Ni	7 (2) v (4) 9	9·4
11	3612	55	Bg	7 (1) v (4) 9	9·3
12	3613	30	D	7−2, 9+4	9·4
12	3613	37	Lp	=7	9·2
13	3614	34	Li	7 (5) v (5) 8	9·2
15	3616	62	Wf	6−5, 9+6	9·3
17	3618	30	D	7−3, 9+4	9·5
18	3619	37	Lp	=8	9·3
19	3620	...	Sa	7−7, =9, 11+4	9·9
20	3621	30	D	7−2, 9+2	9·5
20	3621	55	Bg	7 (1) v (2) 9	9·4
21	3622	34	Li	7 (3) v (7) 9	9·4
22	3623	37	Lp	8 (2) v (2) 9	9·6*b*
22	3623	62	Wf	7−4, 9+4	9·5
24	3625	50	Bn	=9	9·9
25	3626	...	Sa	9−3, 10−3, 11+3	10·0
26	3627	37	Lp	=9	9·9*b*
28	3629	50	Bn	9+1	9·8
Aug					
1	3633	22	Ni	9 (3) v (3) 11	10·1
1	3633	32	Ca	9 (3) v (2) 11	10·1
3	3635	50	Bn	9 (1) v (2) 11	10·0
5	3637	120	Ga	14+2, 13+5	10·2*b*
6	3638	48	Bg	9 (2) v (1) 14	10·2
6	3638	62	Wf	9 (5) v (5) 14	10·1
7	3639	32	Ca	14 (3) v (3) 16	10·7
8	3640	50	Bn	11+1	10·2
9	3641	160	Br	11−5, 17+5	10·8
9	3641	...	Sa	11−4, =13, 17+2	10·8
11	3643	60	D	13+1	10·7
11	3643	37	Lp	14 (2) v (2) 16	10·7*b*
12	3644	62	Wf	9−6, 14+1	10·4
13	3645	50	Bn	11+1	10·2
15	3647	37	Lp	14 (2) v (1) 16	10·8
15	3647	...	Sa	13−3, 16+3, =17	11·0
22	3654	55	Bo	13 (3) v (2) 17	11·1*b*
28	3660	...	Sa	16−3, 19+5	11·3
29	3661	150	Wf	17−3, 20+6	11·6
30	3662	50	Bn	17 (2) v (1) 18	11·6
Sept					
2	3665	94	Ni	17−4, 20+2, 21+2	12·0
5	3668	50	Bn	18 (3) v (2) 20	12·0
5	3668	100	Lp	20−1	12·4*b*
5	3668	75	Pr	=20	12·3*b*
5	3668	...	Sa	=20, =21, 24+4	12·3
5	3668	79	Ma	20+2, 21+3	12·1
6	3669	62	Wf	20+1, 21+3	12·1
6	3669	60	Ga	=20	12·3*b*
6	3669	55	Bo	18 (4) v (1) 20	12·2*b*
6	3669	OG	Ph	=20, 21+3	12·2
8	3671	120	Br	20+2, 21+2	12·1
9	3672	79	Ma	20+2, 21+1	12·2
10	3673	94	Ni	20 (3) v (1) 21	12·4
10	3673	OG	Ph	20−3, 21−2, =24	12·6
11	3674	140	Bo	=20	12·3*b*
11	3674	120	Bn	20+1	12·2

Aug. 1, Ni, With 22, 10·2.
Sept. 6, Ga, T.

1923 Sept					
12	3675	48	Bg	=18	11·7*b*
13	3676	150	Wf	=20, 21+2	12·2
15	3678	120	Bn	20 (2) v (1) 21	12·3
15	3678	79	Ma	=20	12·3*b*
15	3678	75	Pr	20−2, 21+3, 24+4	12·3
18	3681	...	Sa	=24	12·7
29	3692	140	Bo	<21	<12·4*b*
29	3692	120	Bn	21−3	12·7
29	3692	150	Wf	20−4·5, 21−3, 28+2	12·7
30	3693	120	Br	20−2	12·5
Oct					
2	3695	60	Ga	<21	<12·4*b*
4	3697	150	Pr	20−4	12·7*b*
4	3697	...	Sa	20−4	12·7*b*
4	3697	79	Ma	20−6, 21−4	12·8*b*
8	3701	150	Wf	21 (5) v (3) 27	12·6
11	3704	...	Sa	=24	12·7
11	3704	120	Br	20−3, 27+3	12·6
14	3707	,,	Bn	21 (3) v (1) 27	12·7
21	3714	...	Sa	20−2, =21	12·4
28	3721	150	Wf	21−3, 26+3	12·6
28	3721	120	Bn	21 (3) v (1) 27	12·7
Nov					
3	3727	,,	,,	21−2	12·6
4	3728	150	Pr	20−2, =21	12·4
5	3729	120	Br	20−2	12·5
6	3730	,,	Bn	20−3, 21−1	12·5
6	3730	...	Sa	=21	12·4
8	3732	94	Ni	21 (1·5) v (4·5) 25	12·5
10	3734	140	Bo	<21	<12·4*b*
10	3734	120	Bn	21−2	12·6
14	3738	,,	,,	=20	12·3
14	3738	94	Ni	20+1, 21+2	12·2
16	3740	120	Br	20+2	12·1
19	3743	,,	Bn	17 (2) v (1) 18	11·6
30	3754	50	,,	14 (3) v (1) 13	10·7
Dec					
3	3757	120	,,	=14	10·4
3	3757	...	Sa	11−4, 17+2	10·9
9	3763	45	Br	=11	10·3
9	3763	30	D	14−1, 13+3	10·5
9	3763	94	Ni	11 (2) v (3) 14	10·3
9	3763	OG	Ph	9 (1) v (1) 14	10·2
11	3765	55	Bo	9 (2) v (3) 11	10·0*b*
12	3766	62	Wf	9−2, 14+4	10·0
13	3767	...	Sa	9−2, 14+2	10·1
14	3768	32	Ca	9 (2) v (2) 11	10·1
15	3769	50	Bn	9 (1) v (2) 11	10·0
16	3770	55	Bg	9 (1) v (4) 14	10·0*b*
16	3770	100	Lp	8 (2) v (2) 9	9·6*b*
18	3772	50	Bn	7 (3) v (1) 9	9·7
20	3774	,,	,,	7 (2) v (1) 9	9·6
23	3777	,,	,,	6 (4) v (1) 7	9·1
23	3777	55	Bg	[6+15]−2, =5	8·9*b*
24	3778	60	D	6−1, 7+2	9·0
24	3778	...	Sa	=6, 7+4, 8+2	9·0
28	3782	...	,,	2−7, 4−4, 6+4 5+1	8·7
28	3782	45	Br	4−3, 6+3	8·6
30	3784	30	D	4−3, 6+2	8·6

Sept. 12, About.
Oct. 2, T, Invisible.
Oct. 4, Sa, Difficult.
Dec. 9, Ni, With 22, 10·5.

(4511) T URSÆ MAJORIS—*continued.*

1924 Jan					
2	3787	50	Bn	2+1	7·9
2	3787	100	Lp	1 (9) v (1) 2, 2+1	7·9
3	3788	55	Bg	2+1	7·9
3	3788	34	Sa	2+1, 4+3	8·0
4	3789	30	D	2+1	7·9*b*
5	3790	,,	,,	2+2	7·8
6	3791	55	Bo	d (3) v (1) 2	7·9*b*
6	3791	F	Bg	=d	7·6
6	3791	,,	Bn	c (2) v (1) d	7·5
6	3791	37	Lp	=2	8·0*b*
6	3791	90	Wh	2+5	7·5
6	3791	45	Br	2+2	7·8
7	3792	30	D	c−3, 2+2	7·7
9	3794	25	Bn	b (3) v (1) c	7·2
12	3797	55	Bo	d (3) v (2) 2	7·8
12	3797	30	D	b−2, c+1	7·2
14	3799	25	Bn	=b	7·0
15	3800	30	D	b−2, c+2	7·1*b*
15	3800	22	Ni	b (1) v (3) c	7·0
16	3801	32	Ca	1 (4) v (2) b	6·8
20	3805	25	Bn	b (1) v (3) c	7·0
23	3808	22	Ni	=b	7·0
25	3810	25	Bn	b (1) v (1) c	7·1
27	3812	30	D	1−4, b+1	6·8*b*
27	3812	55	Bo	b (3) v (1) c	7·2*b*
27	3812	F	Bg	=b	7·0
27	3812	34	Sa	2+2	7·8
27	3812	45	Br	2+6	7·4
29	3814	F	Lp	b (2) v (2) c	7·1*b*
29	3814	B	Ca	1 (4) v (2) b	6·8
29	3814	25	Bn	b (3) v (2) c	7·2
31	3816	51	Bo	b (2) v (2) c	7·1*b*
Feb					
1	3817	F	Bg	=b	7·0*b*
1	3817	30	Bn	b (2) v (1) c	7·2
1	3817	,,	D	1−4, b+2	6·8
3	3819	F	Lp	=b	7·0
3	3819	50	Ma	2+4	7·6
4	3820	25	Bn	b (3) v (1) c	7·2
6	3822	34	Sa	2+6	7·4
8	3824	30	D	1−5, b+1	6·9
8	3824	F	Wf	1−5, b+2	6·8
8	3824	,,	Lp	=b	7·0*b*
8	3824	,,	Bg	1 (4) v (1) b	6·9
9	3825	B	Ca	1 (3) v (2) b	6·7
14	3830	22	Ni	b+2	6·8
14	3830	30	D	1−4, b+2	6·8
14	3830	55	Bo	=b	7·0*b*
14	3830	F	Lp	=b	7·0*b*
14	3830	,,	Bn	b (3) v (1) c, 2+7·5	7·2
16	3832	25	,,	b (1) v (3) c	7·0
16	3832	34	Sa	1−8, 2+8	7·2
17	3833	30	D	1−4, b+2	6·8*b*
20	3836	25	Bn	=b	7·0
22	3838	33	Ha	=b	7·0
23	3839	F	,,	b (2) v (3) c	7·1
23	3839	32	Ca	1 (4) v (2) b	6·8
23	3839	30	D	b+3	6·7*b*
23	3839	22	Ni	b+2	6·8
24	3840	45	Br	2+5	7·5

Jan. 5, Feb. 8, D, 2c.
Jan. 7, 12, D, 3c.
Jan. 27, D, Difficult, 3c.
Jan. 29, Lp, Difficult.
Feb. 1, D, 2c, With B, 6·8.
Feb. 23, D, Difficult.

1924 Feb					
24	3840	25	Bn	b (2) v (1) c	
25	3841	90	Wh	2+4	
26	3842	25	Bn	b (2) v (1) c	
26	3842	F	Ha	c (1) v (4) 2	
28	3844	30	D	b−1, c+2	
28	3844	F	Wf	=c, d+2	
Mar					
1	3846	B	,,	c−1, d+1	
2	3847	F	Bg	b (1) v (1) c	
2	3847	34	Sa	1−10, =b, 2+5	
3	3848	B	Wf	=c, d+2	
4	3849	40	D	b−3, c+2	
4	3849	F	Lp	=c	
4	3849	,,	Ha	c (3) v (2) 2	
4	3849	25	Bn	b (3) v (1) c	
5	3850	32	Ca	=c	
5	3850	22	Ni	=c	
6	3851	F	Ha	c (2) v (3) 2	
8	3853	30	D	c−3, 2+5	
8	3853	F	Lp	=c	
8	3853	25	Bn	c−2, =d	
8	3853	F	Bg	=b	
8	3853	55	Bo	c (2) v (1) d	
9	3854	F	Ha	c (3) v (2) 2	
10	3855	32	Ca	=c	
10	3855	34	Sa	1−10, 2+4	
10	3855	F	Bg	b (1) v (2) c	
11	3856	30	D	c−3, 2+5	
11	3856	50	Ma	2+2, 6+7	
11	3856	100	Lp	c (1) v (2) 2, c−1	
11	3856	F	Ha	c (1) v (1) 2	
11	3856	25	Bn	d (1) v (2) 2	
12	3857	22	Ni	2 (1·5) v (5) 4	
12	3857	55	Bo	d (1) v (3) 2	
13	3858	50	Bn	2+1	
13	3858	F	Ha	c (3) v (2) 2	
19	3864	30	D	2−5	
19	3864	50	Bn	2+1	
24	3869	55	Bg	2 (2) v (1) 4	
25	3870	32	Ca	=2	
27	3872	34	Sa	4−1, 5+4	
29	3874	45	Br	4−1	
29	3874	37	Lp	4 (2) v (2) 5	
29	3874	50	Bn	4+1	
30	3875	55	Bg	4 (1) v (4) 5	
30	3875	50	Ma	4 (1) v (1) 9, 6+2	
30	3875	30	D	4−3, 6+2	
30	3875	22	Ni	4 (3) v (5) 7	
Apr					
1	3877	50	Bn	4 (2) v (1) 6	
4	3880	,,	,,	4 (4) v (1) 6	
4	3880	30	D	4−4, 6+1	
6	3882	55	Bg	=5, 7+3	
7	3883	,,	Bo	4 (2) v (4) 5	
7	3883	32	Ca	6 (2) v (2) 7	
7	3883	37	Lp	4 (3) v (2) 7, =5	
7	3883	50	Bn	6 (1) v (3) 7	
8	3884	62	Wf	4−4, 6+2	
9	3885	50	Bn	6 (1) v (2) 7	
10	3886	30	D	6−2, 7+1	
11	3887	32	Ca	6 (3) v (1) 7	
12	3888	34	Sa	5−3, 6−1, 9+5	
14	3890	50	Bn	6 (4) v (1) 7	

Feb. 28, D, 2c·5.
Mar. 4, D, 2c.
Mar. 8, 11, D, 3c.

(4511) T URSÆ MAJORIS—*continued.*

1924						1924					
Apr						July					
15	3891	55	Bg	7 (2) v (3) 9	9·4	26	3993	94	Ni	27 (2) v (2) 29	12·9*b*
17	3893	22	Ni	7 (2) v (3) 9	9·4	29	3996	M	Ph	24 (1) v (1) 27, 24−2	12·8
20	3896	32	Ca	7 (5) v (2) 9	9·7	29	3996	120	Bn	20−4, 21−3, 27+1	12·7
20	3896	37	Lp	=9	9·9*b*	30	3997	130	Ma	20−5, 21−3, 27+1	12·7*b*
20	3896	68	Ha	5 (2) v (3) 7	9·0*b*	30	3997	150	Wf	25−1, 27+1	12·8
20	3896	50	Bn	7 (3) v (2) 9	9·6	31	3998	94	Ni	25 (2) v (1) 27	12·8*b*
23	3899	62	Wf	9−2, 14+4	10·0	Aug					
25	3901	55	Bg	9 (1) v (4) 14	10·0*b*	2	4000	120	Bn	27+1, 28+2	12·7
26	3902	34	Sa	9−1, 14+3	10·0	5	4003	157	Wf	21−6, 27+2	12·8
May						7	4005	120	Bn	20−4, 21−3, 27+1, 28+2	12·7
1	3907	50	Bn	9 (3) v (2) 11	10·1	7	4005	130	Ma	20−5·5	12·8*b*
4	3910	60	D	9−4, 14+2	10·2	18	4016	121	Ha	22 (2) v (3) 27	12·6
5	3911	22	Ni	11 (4) v (1·5) 14	10·4	18	4016	130	Ma	20−0·5	12·3
5	3911	32	Ca	11 (1) v (6) 16, =14	10·4	19	4017	120	Br	20−1, =21	12·4
5	3911	62	Wf	=11, 13+4	10·3	19	4017	,,	Bn	20−3, 21−2	12·6
5	3911	55	Bg	14 (1) v (3) 13	10·5	22	4020	157	Wf	20−1, 21+3	12·2
7	3913	50	Bn	11 (2) v (1) 14	10·4	25	4023	90	Sa	=20	12·3
7	3913	68	Ha	=14	10·4	26	4024	121	Ha	18 (1) v (4) 21	11·9*b*
7	3913	34	Sa	9−6, 13+3	10·5	27	4025	90	Sa	=21	12·4*b*
7	3913	60	D	9−4, 14+2	10·2	27	4025	150	Wf	=20	12·3
9	3915	,,	,,	14+1	10·3	31	4029	100	Lp	17 (2) v (2) 20	11·8*b*
11	3917	62	Wf	11−5, 17+3	10·9	31	4029	75	Bn	13 (4) v (1) 17	11·2
13	3919	60	D	=14	10·4*b*	31	4029	,,	Bg	17 (1) v (4) 18	11·4
13	3919	94	Ni	14 (1) v (4) 17	10·6	Sept					
16	3922	134	Sa	14−4, =17	11·0	3	4032	90	Sa	11−10, 18+5	11·3
19	3925	55	Bg	13 (3) v (2) 17	11·1*b*	3	4032	62	Wf	14−3, 17+5	10·7
19	3925	50	Bn	13−6, =17	11·3*b*	5	4034	121	Ha	13 (4) v (1) 17	11·2
19	3925	68	Ha	13 (3) v (2) 17	11·1	7	4036	79	Ma	13−3	11·1
23	3929	60	D	=18	11·7	7	4036	,,	Bn	13 (1) v (3) 17	10·9
23	3929	62	Wf	17−3, 20+5	11·7	8	4037	50	,,	11 (2) v (1) 13	10·6
25	3931	94	Ni	17−4, 20+4, 21+5	11·8	8	4037	90	Sa	13−2, 17+3	11·0
26	3932	60	D	18−2, 20+4	11·9	9	4038	50	Ma	14+1	10·3
27	3933	32	Ca	18 (3) v (2) 20	12·0	10	4039	40	D	9 (2) v (1) 14	10·2
27	3933	OG	Ph	=20	12·3	10	4039	62	Wf	9−4, 11+1	10·2
29	3935	62	Wf	20+1	12·2	12	4041	94	Ni	9 (3) v (3) 11	10·1
30	3936	60	D	18−3, 20+2	12·0	14	4043	50	Bn	9 (1) v (2) 11	10·0
June						14	4043	68	Ha	11 (2) v (3) 13	10·5
1	3938	,,	,,	=20	12·3	17	4046	34	Sa	=9	9·9
2	3939	150	Wf	20−1, =21	12·4	22	4051	37	Lp	5 (2) v (1) 7	9·1
2	3939	79	Ma	20+2	12·1	22	4051	55	Bg	5 (1) v (1) 7	9·1*b*
5	3942	60	D	=21	12·4	22	4051	50	Bn	7 (1) v (3) 9	9·3
8	3945	94	Ni	=20, 21−1	12·4	23	4052	86	Ha	6 (3) v (2) 7	9·0
20	3957	120	Bn	20−4	12·7	24	4053	50	Bn	6 (3) v (1) 7	9·1
20	3957	M	Ph	21 (1) v (1) 27, 21−2	12·6	26	4055	62	Wf	4−5, 6+1, 9+10	8·8
22	3959	120	D	21−5	12·9*b*	27	4056	45	Br	=6	8·8
22	3959	150	Wf	21−3, =24	12·7	27	4056	50	Bn	4 (3) v (1) 6	8·7
24	3961	79	Ma	20−5	12·8*b*	27	4056	34	Sa	5−3, 6−3, 7+1	9·2
26	3963	157	Wf	21−5, 27+2	12·8	27	4056	68	Ha	=6	8·8
29	3966	120	D	21−7	13·1	28	4057	37	Lp	[6+15] (2) v (2) 5	8·8*b*
30	3967	150	Wf	21−5, 27+4	12·7	29	4058	31	D	4−4, 6+1	8·7
July						Oct					
4	3971	68	Ha	=28	12·9	1	4060	33	Ha	4 (1) v (2) 6	8·5
4	3971	130	Ma	20−5, 27+2	12·7	3	4062	37	Lp	=[6+15]	8·7*b*
4	3971	M	Ph	27 (1) v (1) 29, 28−1	13·0	4	4063	33	Ha	4 (1) v (1) 6	8·6
6	3973	94	Ni	=27	12·8	5	4064	62	Wf	4−1, 6+4	8·4*b*
7	3974	157	Wf	27+1	12·7	5	4064	32	Ca	4 (2) v (3) 6	8·5
11	3978	120	Bn	20−4, 21−3, 27+1	12·7	6	4065	34	Sa	5−1, 7+3	9·0
13	3980	M	Ph	27+2	12·6	8	4067	55	Bg	4 (1) v (2) 5	8·5
20	3987	157	Wf	27+1	12·7	8	4067	50	Bn	2 (3) v (1) 4	8·3
21	3988	120	Bn	20−4, 21−3, 27+1	12·7	12	4071	,,	,,	2 (1) v (2) 4	8·1
24	3991	157	Wf	27+1·5, 28+3	12·7						
24	3991	121	Ha	21 (3) v (2) 27	12·7						

May 13, D, About.
June 22, D, Difficult.
June 24, Difficult.
June 29, Very difficult.

July 26, 31, Difficult. Unsteady.
July 30, Ma, Very difficult. Not sure.
Aug. 31, Lp, Difficult.
Sept. 7, Bn, 8½-in. mirror.
Sept. 12, Difficult.

(4511) T URSÆ MAJORIS—*continued.*

1924					
Oct					
16	4075	62	Wf	4−1, 5+5	8·5
17	4076	45	Br	2−2, 4+2	8·2
19	4078	33	Ha	4 (1) v (2) 5	8·5
19	4078	50	Bn	2 (2) v (3) 4	8·1
22	4081	,,	,,	2 (2) v (1) 4	8·2
22	4081	34	Sa	4−4, 5+4, 6+2	8·6*b*
23	4082	,,	Li	=2	8·0
23	4082	22	Ni	2 (4) v (1) 4	8·3
23	4082	31	D	=4	8·3
23	4082	37	Lp	4 (2) v (2) [6+15]	8·5*b*
23	4082	33	Ha	4 (1) v (3) 5	8·5
23	4082	55	Bg	2 (2) v (1) 4	8·2
29	4088	32	Ca	=3	8·2
30	4089	55	Bg	2 (1) v (1) 4	8·2
30	4089	33	Ha	4 (1) v (1) 5	8·7
Nov					
3	4093	50	Bn	2 (2) v (1) 4	8·2
3	4093	34	Sa	=4	8·3
3	4093	45	Br	4+1	8·2
3	4093	31	D	=4	8·3
4	4094	22	Ni	4+0·5	8·3
4	4094	75	Lp	4 (2) v (1) [6+15]	8·6*b*
4	4094	33	Ha	=4	8·3
8	4098	68	,,	4 (1) v (4) 6	8·4
8	4098	55	Bo	=4	8·3*b*
10	4100	50	Bn	4 (1) v (4) 6	8·4
16	4106	,,	,,	4 (3) v (2) 6	8·6
16	4106	68	Ha	4 (1) v (4) 5	8·5
17	4107	55	Bg	4 (4) v (1) 5	8·8
17	4107	34	Sa	4−3, 5+3	8·7
17	4107	30	D	4−5, 5+1	8·9
17	4107	34	Li	=4	8·3
22	4112	32	Ca	4 (3) v (2) 6	8·6
23	4113	22	Ni	4 (3) v (2) 7	8·8
27	4117	90	Wh	=5	9·0
1924					
Nov					
27	4117	50	Bn	6 (2) v (1) 7	
30	4120	,,	,,	6 (2) v (1) 7	
30	4120	55	Bo	7 (1) v (6) 9	
30	4120	60	D	6−2, 7+1	
30	4120	34	Li	4 (7) v (3) 5	
Dec					
3	4123	32	Ca	5 (1) v (1) 7	
5	4125	50	Bn	7+1	
6	4126	68	Ha	=7	
9	4129	34	Li	=7	
14	4134	,,	,,	7 (7) v (3) 8	
14	4134	90	Wh	=9	
14	4134	34	Sa	7−5, 9+2	
14	4134	68	Ha	7 (3) v (2) 9	
14	4134	50	Bn	7−3, 9+4	
14	4134	55	Bg	7 (3) v (1) 9	
22	4142	,,	Bo	7 (4) v (3) 9	
22	4142	60	D	9−2, 14+4	
23	4143	94	Ni	9 (4) v (3) 11	
24	4144	32	Ca	9 (1) v (3) 12	
25	4145	60	D	9−4, 14+2	
26	4146	55	Bg	9 (4) v (1) 14	
26	4146	50	Bn	9 (3) v (2) 13	
26	4146	90	Wh	9 (1) v (2) 13	
27	4147	,,	Sa	=13, =14	
28	4148	68	Ha	9 (4) v (1) 11	
29	4149	55	Bo	9 (2) v (3) 11	
30	4150	50	Bn	11 (3) v (2) 13	
30	4150	75	Lp	11 (2) v (2) 13	
30	4150	94	Ni	=14	
31	4151	75	Bg	=14	

Dec. 30, Ni, With 22, 10·3.

(5601) S URSÆ MINORIS. (V. 2.)

H.D. 153378.

Date.	Julian Date.	Inst.	Observer.	Comparisons.	Deduced Mag.
1920					
Jan					
5	2329	90	Bh	7−5, =12	8·9
8	2332	23	Bo	=19	9·3*b*
8	2332	40	Hw	=20	9·6*b*
13	2337	90	Bh	12−1, 17+1	9·0*b*
14	2338	23	Bo	19 (1) v (1) 20	9·4*b*
14	2338	60	D	19 (2) v (3) 25, 19−5	9·8*b*
15	2339	90	Bh	12−2	9·0
16	2340	40	Hw	20 (7·5) v (2·5) 25	10·3*b*
17	2341	80	AB	26+3·5	10·5
19	2343	23	Bo	20 (1) v (1) 21	9·7*b*
19	2343	30	Bn	16 (3) v (1) 22	9·8
19	2343	40	Hw	20 (6·5) v (3·5) 25	10·2
21	2345	90	Bh	12−3	9·1
1920					
Jan					
21	2345	60	Ga	26+5, 29+10	
22	2346	80	AB	26+3·5	
23	2347	55	Bo	=20	
24	2348	50	Bn	22+1	
24	2348	90	Bh	7−6, 12−1, 19+3	
24	2348	62	Th	22+2	
29	2353	80	AB	26+1, 29+3	
29	2353	55	Bo	20 (1) v (3) 21	
Feb					
1	2356	,,	,,	=22	
4	2359	90	Bh	=19	
5	2360	80	AB	29+1	
6	2361	55	Bo	20 (3) v (1) 22	
6	2361	90	Hw	=25	
7	2362	80	AB	29−2	
8	2363	120	Bn	22−4, 25+2	
11	2366	90	Bh	19−5, 25+5	

Jan. 21, Ga, t.

(5601) S URSÆ MINORIS—*continued.*

1920					
Feb					
11	2366	55	Bo	20 (3) v (1) 22	9·9
11	2366	62	Th	20−2	9·8*b*
13	2368	80	AB	29+1	10·6*c*
15	2370	55	Bo	24 (3) v (1) 25	10·4
15	2370	90	Bh	19−5, 25+5	9·9
17	2372	50	Bn	22 (5) v (1) 25	10·4
17	2372	90	Bh	25+5	10·0
17	2372	40	Hw	25 (5) v (5) 29	10·6*b*
18	2373	60	D	25+1	10·4*b*
18	2373	80	AB	25+1	10·4
19	2374	55	Bo	24 (1) v (1) 25	10·3
22	2377	,,	,,	24 (4) v (1) 25	10·4
23	2378	90	Bh	=24, 25+3	10·2
24	2379	40	Hw	25 (5) v (5) 29	10·6*b*
28	2383	55	Bo	24 (3) v (1) 25	10·4
29	2384	80	AB	25+1, 29−2	10·7*c*
Mar					
3	2387	55	Bo	24 (4) v (1) 25	10·4
7	2391	120	Bn	29 (1) v (2) 30	10·9
7	2391	90	Bh	24−2, 25+1	10·4
8	2392	55	Bo	24 (7) v (1) 25	10·4
9	2393	157	Th	25+2	10·3
11	2395	79	Ma	=25	10·5
11	2395	90	Bh	25+1	10·4
12	2396	55	Bo	=25	10·5
12	2396	120	Bn	29 (1) v (1) 30	11·0
12	2396	40	Hw	25 (5) v (5) 29	10·6
15	2399	79	Ma	25−1	10·6
16	2400	80	AB	29−4	11·2*c*
16	2400	55	Bo	=25	10·5
17	2401	90	Bh	25−1	10·6
18	2402	200	Bn	30 (2) v (1) 31	11·5
19	2403	60	D	29−3	11·1*b*
19	2403	55	Bo	=25	10·5
19	2403	80	AB	29−5, n+4	11·6*b*
21	2405	,,	,,	29−5·5, n+3·5	11·7
22	2406	90	Bh	25−1, 29+2	10·6
22	2406	,,	Hw	=29	10·8*b*
23	2407	79	Ma	25−2	10·7
25	2409	160	Bo	25 (3) v (1) 29	10·7
26	2410	80	AB	29−6, n+5	11·6*c*
30	2414	130	Bo	=25	10·5*c*
31	2415	90	Bh	29−1	10·9
Apr					
6	2421	55	Bo	30 (1) v (3) 31	11·3
6	2421	80	AB	29−5·5, n+3	11·7*b*
11	2426	,,	,,	n+1	12·2*b*
12	2427	90	Bh	29−5	11·3
13	2428	120	D	29 (5) v (3) 32	11·7*b*
15	2430	105	Bo	30 (1) v (1) 31	11·4
17	2432	90	Bh	29−5	11·3*b*
21	2436	,,	,,	29−4, =30	11·2
22	2437	80	AB	n−3, 0+2	12·6*b*
23	2438	120	D	=31	11·6*b*
27	2442	90	Bh	29−3, =30	11·2
May					
4	2449	,,	,,	25−6, =29, 30+3	10·9*b*
5	2450	80	AB	n−1, 0+5·5	12·2*c*
7	2452	79	Ma	29−2	11·0
7	2452	60	D	=31	11·6*c*
9	2454	79	Ma	25−4, 29−2	10·9

1920					
May					
13	2458	120	Bn	30 (3) v (1) 31	11·5
13	2458	90	Bh	25−4, =29	10·8
14	2459	120	D	32+2	12·0*b*
14	2459	79	Ma	25−2	10·7
15	2460	80	AB	29−3, n+3	11·6*b*
17	2462	90	Bh	25−2, 29+2	10·6*b*
18	2463	79	Ma	25−3, 29−1	10·8
19	2464	120	Bn	30 (3) v (1) 31	11·5
22	2467	79	Ma	25 (2) v (3) 29	10·6
23	2468	90	Bh	25−2, 29+1	10·7
23	2468	150	Bn	30 (2) v (1) 31	11·5
26	2471	80	AB	29−3, n+4·5	11·5*b*
June					
3	2479	183	Ma	=29	10·8
6	2482	80	AB	25−3, =29	10·8*b*
8	2484	120	Bn	25 (1) v (1) 29	10·6
8	2484	90	Bh	25+1	10·4
9	2485	120	D	25−2, 29+1	10·7
14	2490	79	Ma	=25	10·5
15	2491	120	D	25−1, 29+2	10·6
15	2491	90	Bh	25+3	10·2
19	2495	,,	,,	25+4	10·1
19	2495	120	Bn	25+1	10·4
20	2496	80	AB	25−3·5, 29+3	10·7*b*
23	2499	,,	,,	25+2	10·3*c*
23	2499	90	Bh	25+5	10·0
29	2505	,,	,,	12−5, 17−1	9·3
July					
9	2515	30	D	=21	9·9*b*
10	2516	80	AB	25+3·5	10·1*b*
11	2517	,,	,,	20−4·5, 26+3	10·3*b*
14	2520	,,	,,	20−5·5, 26+3	10·3
15	2521	90	Bh	12−4, 17+2	9·1
15	2521	79	Ma	12 (1) v (3) 26	9·3
18	2524	50	Bn	12 (1) v (3) 19	8·9
20	2526	30	D	19−2, 21+4	9·5*b*
20	2526	80	AB	20−3, 26+5	10·1*b*
24	2530	50	Bn	7 (4) v (1) 10	8·7
30	2536	90	Bh	12−1	8·9
Aug					
1	2538	30	D	=19	9·3*b*
2	2539	80	AB	19+0·5	9·3*b*
3	2540	79	Ma	12+1	8·7
6	2543	80	AB	19−1, 20+2	9·4
8	2545	90	Bh	7−3, 12+1	8·7
9	2546	75	Bn	7 (3) v (1) 12	8·7
9	2546	50	Ma	12+2	8·6
12	2549	80	AB	=19	9·3
13	2550	90	Bh	12+1	8·7
14	2551	30	Bn	10+1, 12+2	8·7*b*
15	2552	50	Ma	7 (7) v (1) 12	8·8
16	2553	23	Bo	7 (1) v (1) 12	8·6*b*
17	2554	55	,,	7 (3) v (1) 12	8·7
19	2556	90	Bh	7−1	8·5
20	2557	30	Bn	7 (1) v (2) 10, 12+4	8·5
20	2557	25	AB	7−5·5, 12+2	8·8*b*
22	2559	50	Ma	7 (2) v (1) 12, 12+2	8·7
26	2563	30	Bn	7 (2) v (1) 10, 12+3	8·6
27	2564	80	AB	7−4·5, 12+1	8·8
30	2567	,,	,,	7−5, 12+2	8·8

Mar. 11, Ma, About.
April 6, Bo, With 105, 11·4.
April 13, Difficult.
April 23, About. Difficult.
May 7, D, About. Difficult.
May 14, D, Difficult.
July 9, Aug. 1, About. Difficult.
July 15, Aug. 3, Ma, Pale red.
Aug. 15, Orange with touch of red.
Aug. 22, Reddish orange.

(5601) S URSÆ MINORIS—*continued.*

1920					
Sept					
4	2572	50	Ma	7 (1) v (9) 12	8·4
4	2572	90	Bh	7+1	8·3*b*
6	2574	30	Bn	5 (1) v (1) 7	8·3
6	2574	25	AB	7−4, 12+3	8·7
8	2576	23	Bo	3 (4) v (1) 7	8·3
9	2577	30	D	7−3, 12+2	8·7
10	2578	40	Hw	=7	8·4
10	2578	30	Bn	=5, 7+2	8·2
12	2580	75	,,	=5, 7+1	8·3
12	2580	23	Bo	3 (3) v (1) 7	8·3
12	2580	80	AB	7−4, 12+3	8·7
13	2581	150	Bh	7+2	8·2
16	2584	90	,,	7+2	8·2
18	2586	30	Bn	5+1, 7+2	8·2
18	2586	50	Ma	7 (1) v (1) 12	8·6
19	2587	23	Bo	3 (3) v (1) 7	8·3
19	2587	90	Bh	7+3	8·1
19	2587	80	AB	7−3, 12+3	8·6
22	2590	25	,,	7−3, 12+4	8·6
22	2590	90	Bh	7+3	8·1
25	2593	,,	,,	7+3	8·1
27	2595	40	Hw	=7	8·4*b*
27	2595	50	Bn	5−1, 7+2	8·3
29	2597	23	Bo	3 (3) v (1) 7	8·3
29	2597	25	AB	7−1, 12+5·5	8·4
29	2597	90	Bh	7+3	8·1
29	2597	50	Ma	7+2·5	8·2
Oct					
3	2601	25	AB	7−2, 12+5	8·5
4	2602	23	Bo	3 (4) v (1) 7	8·3
4	2602	30	D	3−5, 7+1	8·3
6	2604	45	Bh	7+4, 12+10	7·9
8	2606	40	Hw	7 (3) v (7) 12	8·5
9	2607	50	Bn	5+1, 7+2	8·2
9	2607	23	Bo	3 (4) v (1) 7	8·3
11	2609	30	D	7+1	8·3
12	2610	90	Bh	7+3	8·1
13	2611	50	Ma	7+2·5	8·2*b*
13	2611	25	AB	7−4, 12+4	8·6
13	2611	30	Bn	5+1, 7+2	8·2
14	2612	23	Bo	3 (3) v (1) 7	8·3
18	2616	45	Bh	7+2	8·2
18	2616	50	Ma	=7	8·4
19	2617	55	Bo	3 (4) v (1) 7	8·3
19	2617	50	Bn	7+2	8·2*b*
19	2617	40	Hw	7 (5) v (5) 12	8·6*b*
22	2620	25	AB	7−3, 12+4	8·6
23	2621	50	Bn	5−2, 7+1, 8+1	8·3
23	2621	,,	Ma	7+2	8·2
25	2623	25	AB	7−4, 12+3	8·7*b*
25	2623	55	Bo	3 (4) v (1) 7	8·3
27	2625	25	AB	7−4, 12+3	8·7
28	2626	40	Hw	7 (3) v (7) 12	8·5*b*
29	2627	50	Bn	7 (1) v (2) 12	8·5
30	2628	90	Bh	7+2	8·2
30	2628	55	Bo	=7	8·4
31	2629	25	AB	12+2	8·6
Nov					
1	2630	45	Bh	7+1	8·3
1	2630	30	D	7−4, 12+1	8·8*b*
4	2633	50	Bn	7 (2) v (1) 12	8·7

Sept. 4, Ma, Golden yellow.
Sept. 12, AB, With 25, 8·7.
Sept. 18, Oct. 13, Ma, Pale red.
Sept. 19, AB, With 25, 8.5.
Sept. 29, Ma, Reddish.

1920					
Nov					
4	2633	55	Bo	=7	
4	2633	25	AB	12−2·5, 19+1	
6	2635	,,	,,	12−1·5, 19+1	
8	2637	90	Bh	7−1, 12+3	
8	2637	55	Bo	7 (1) v (4) 12	
10	2639	25	AB	19−1, 20+2	
11	2640	50	Ma	7 (1) v (2) 12	
12	2641	40	Hw	=12	
13	2642	,,	,,	12 (4) v (6) 19	
15	2644	50	Bn	12 (2) v (1) 19	
16	2645	55	Bo	7 (2) v (1) 12	
16	2645	90	Bh	7−2, 12+2	
16	2645	30	D	7−5, 12+1	
18	2647	25	AB	19−1, 20+2	
18	2647	50	Ma	=12	
20	2649	90	Bh	=12	
20	2649	40	Hw	=12	
20	2649	55	Bo	7 (4) v (1) 12	
21	2650	50	Ma	=12	
21	2650	,,	Bn	7 (4) v (1) 12	
23	2652	25	,,	12+1, 17+3, 19+3	
30	2659	90	Bh	7−3, 12+1	
Dec					
1	2660	55	Bo	=12	
1	2660	25	AB	20−4, 25+5	
3	2662	50	Ma	12−2	
6	2665	90	Bh	12−2, 17+2	
7	2666	,,	,,	=17	
12	2671	55	Bo	12 (1) v (3) 19	
12	2671	50	Bn	16 (1) v (1) 22	
16	2675	,,	Ma	=19, 25+7	
20	2679	25	AB	20−2·5, 25+2	
21	2680	90	Hw	19 (6) v (4) 25	
21	2680	,,	Bh	=17	
22	2681	55	Bo	12 (4) v (1) 19	
25	2684	90	Bh	17−1, =19	
28	2687	40	Hw	v (5) 25 (5) 29	
28	2687	30	Bn	16 (5) v (1) 22, 24+3	
31	2690	90	Bh	19−1	
1921					
Jan					
1	2691	80	AB	25+3	
6	2696	,,	,,	25+3	
8	2698	90	Bh	17−5, 19−2, 25+8	
13	2703	,,	,,	=21, 25+5	
14	2704	55	Bo	19 (3) v (1) 20	
14	2704	75	Bn	25+1	
15	2705	40	Hw	=25	
16	2706	25	AB	25−2	
24	2714	90	Bh	25+1	
27	2717	55	Bo	20 (3) v (1) 22	
29	2719	80	AB	29−2	
30	2720	45	Bh	25+1	
31	2721	55	Bo	22 (1) v (1) 24	
31	2721	120	Bn	25 (1) v (1) 29	
Feb					
2	2723	40	Hw	=25	
2	2723	90	Bh	=25	
3	2724	80	AB	25−4	
5	2726	160	Bo	24 (3) v (1) 25	
9	2730	90	Bh	25−3, =29	
13	2734	80	AB	29−3	
14	2735	120	Bn	=30	

Nov. 11, Pale red.
Nov. 18, Ma, Pale yellow.
Jan. 1, 6, With 25, 10·2.

(5601) S URSÆ MINORIS—*continued.*

1921 Feb 17	2738	79	Ma	25−1·5, 29−1	10·8
18	2739	90	Bh	=29	10·8
19	2740	160	Bo	25 (2) v (1) 29	10·7
20	2741	90	Bh	=29	10·8
24	2745	130	Bo	30 (1) v (3) 31	11·3*b*
24	2745	90	Hw	29 (5) v (5) 30	11·0*b*
25	2746	,,	Bh	=29	10·8
26	2747	120	Bn	29 (2) v (1) 30	11·1
27	2748	160	Bo	30 (1) v (1) 31	11·4*b*
Mar 1	2750	90	Hw	=30	11·2*b*
2	2751	83	Li	25 (5) v (5) 32	11·3*b*
2	2751	160	Bo	30 (1) v (1) 31	11·4
2	2751	120	Bn	30 (1) v (1) 31	11·4
2	2751	90	Bh	=29	10·8
4	2753	80	AB	29−5, n+3	11·7*b*
6	2755	90	Bh	29−3, =30	11·2
7	2756	160	Bo	30 (1) v (1) 31	11·4
7	2756	90	Hw	30 (5) v (5) 31	11·4
10	2759	,,	,,	=31	11·6*b*
10	2759	120	Bn	30 (2) v (1) 31	11·5
10	2759	160	Bo	30 (3) v (1) 31	11·5
10	2759	90	Bh	25−6, 29−3	11·1
14	2763	,,	,,	=30	11·2*b*
15	2764	55	Bo	30 (3) v (1) 31	11·5
16	2765	90	Bh	29−3	11·1
21	2770	160	Bo	30 (1) v (3) 31	11·3*b*
21	2770	90	Bh	29−2, 30+1	11·1
24	2773	120	Bn	30 (2) v (1) 31	11·5
24	2773	90	Hw	30 (3) v (7) 31	11·3*b*
25	2774	79	Ma	25−1, 29−2, =30	10·9
29	2778	90	Bh	29+1	10·7
30	2779	79	Ma	25−1·5, 29−1	10·8
30	2779	140	Bo	30 (1) v (1) 31	11·4
30	2779	120	Bn	30 (2) v (1) 31	11·5
Apr 2	2782	160	Bo	30 (1) v (3) 31	11·3
3	2783	79	Ma	25−1, 29−2, 32+3	11·2
4	2784	90	Bh	=25	10·5
5	2785	79	Ma	25−1·5, 29−1·5	10·8
6	2786	150	Bn	30 (2) v (1) 31	11·5
7	2787	160	Bo	29 (1) v (3) 30	10·9
7	2787	90	Bh	25+1	10·4
7	2787	83	Li	25 (6) v (4) 29	10·7
10	2790	90	Bh	25+1	10·4
12	2792	,,	,,	25+2	10·3
12	2792	160	Bo	=25	10·5
14	2794	79	Ma	25+2, 29+2	10·4
18	2798	55	Bo	24 (2) v (1) 25	10·4
23	2803	90	Bh	25+5	10·0
25	2805	,,	,,	25+5	10·0
27	2807	,,	,,	25+5	10·0
28	2808	83	Li	25 (5) v (5) 29	10·6
28	2808	120	Bn	25 (2) v (1) 29	10·7
28	2808	55	Bo	22 (1) v (1) 24	10·1
29	2809	90	Bh	25+6	9·9
May 1	2811	83	Li	25 (3) v (7) 29	10·6
8	2818	120	Bn	25 (3) v (1) 29	10·7
9	2819	90	Bh	12−10, 25+7	9·8
10	2820	55	Bo	22 (1) v (3) 24	10·1
15	2825	90	Bh	19−2, 25+10	9·5*b*
20	2830	55	Bo	17 (1) v (3) 19	9·2
May 21	2831	50	Bn	22 (1) v (3) 25	10·1
23	2833	79	Ma	25+2	10·3
23	2833	90	Bh	=19	9·3
24	2834	,,	,,	12−5, =19	9·3
29	2839	62	Wf	20−1, 26+3	10·1
29	2839	120	D	25+0·5	10·4
31	2841	80	AB	25+1	10·4
June 1	2842	55	Bo	17 (1) v (3) 19	9·2
2	2843	90	Bh	12−4, =17, 19+2	9·2
6	2847	50	Bn	22−1, =24	10·2
7	2848	62	Wf	20 (1) v (1) 26	10·2
10	2851	90	Bh	12−2, 17+2	9·0
11	2852	50	Ma	25+2·5, 29+3·5	10·3
11	2852	,,	Bn	22−1, =24	10·2
12	2853	80	AB	25+3	10·2*c*
14	2855	55	Bo	17 (1) v (1) 19	9·3
16	2857	60	D	25+7	9·8*b*
21	2862	90	Bh	12−2	9·0
23	2864	50	Bn	22+1	9·9
25	2866	60	D	19 (2) v (5) 25	9·6*b*
25	2866	62	Wf	20−1, 26+3	10·1
27	2868	90	Bh	7−6, =12	8·9
28	2869	50	Bn	16 (3) v (1) 22	9·8
July 1	2872	90	Bh	7−6, 12−2	9·0
2	2873	,,	,,	=12	8·8
5	2876	50	Bn	16 (1) v (1) 22	9·6
5	2876	,,	Ma	12−4	9·2
8	2879	30	D	19−2·5, 21+4	9·5
8	2879	62	Wf	20−1, 26+3	10·1
9	2880	50	Bn	16 (1) v (2) 22	9·5
11	2882	90	Bh	=12	8·8
11	2882	30	D	19−2, 21+4	9·5
13	2884	62	Wf	=19	9·3
18	2889	90	Bh	7−2, 12+2	8·6
22	2893	62	Wf	12 (1) v (1) 19	9·1
23	2894	90	Bh	7−2, 12+2	8·6
25	2896	30	D	12−1, 19+4	8·9*b*
25	2896	50	Bn	7 (4) v (1) 12	8·7
26	2897	45	Bh	=7	8·4
29	2900	90	,,	7+2	8·2
30	2901	30	D	=12	8·8
30	2901	62	Wf	=12	8·8
Aug 3	2905	50	Ma	12+1·5	8·7
3	2905	30	D	7−5, =12	8·9*b*
4	2906	25	AB	12−1, 19+3	9·0
6	2908	30	D	7−4, 12+2	8·7*b*
6	2908	62	Wf	12+1	8·7
8	2910	75	Bn	7 (2) v (1) 12	8·7
9	2911	55	Bo	7 (1) v (3) 12	8·5
11	2913	30	D	7−4, 12+2	8·7*b*
12	2914	90	Bh	7+3	8·1
13	2915	50	Ma	7 (4) v (1) 12	8·7
15	2917	90	Bh	7+3	8·1
19	2921	,,	,,	7+3	8·1
19	2921	62	Wf	12+3	8·5
22	2924	45	Bh	7+3, 6+5	8·1

Mar. 29, April 12, Bh, Orange.
April 3, Difficult.
April 6, t.
April 14, Reddish.

May 23, Ma, Pale red.
June 16, 25, July 25, D, Difficult.
June 25, July 8, 13, 22, 30, Aug. 19, Wf, 3-in.
July 5, Ma, Reddish.
Aug. 3, Ma, Orange.
Aug. 6, Wf, 6-in.
Aug. 13, Orange inclining to red.

(5601) S URSÆ MINORIS—*continued.*

1921					
Aug					
23	2925	55	Bo	3 (2) v (1) 5	8·1
23	2925	30	D	7−3, 12+1	8·7*b*
25	2927	,,	Bn	=5	8·2*b*
25	2927	90	Bh	7+2	8·2
25	2927	50	Ma	7+1	8·3
26	2928	30	D	7−1, 12+5	8·4
28	2930	,,	,,	7−3, 12+2	8·7
28	2930	25	AB	12+3	8·5
29	2931	50	Ma	7+2	8·2
30	2932	55	Bo	5 (1) v (1) 7	8·3
30	2932	90	Bh	7+3	8·1
31	2933	30	D	7−2, 12+3	8·6*b*
Sept					
2	2935	,,	,,	7−1, 12+3	8·5
3	2936	50	Ma	7 (1) v (1) 12	8·6
3	2936	30	Bn	5−1, 7+1	8·3
4	2937	55	Bo	5 (1) v (1) 7	8·3
5	2938	30	Bn	5−1·5, 7+1	8·3
6	2939	45	Bh	7+2	8·2
6	2939	30	D	=7	8·4
6	2939	25	AB	12+3	8·5
7	2940	30	Bn	5−1, 7+1	8·3
8	2941	,,	D	7−1, 12+3	8·5
8	2941	40	Hw	=7	8·4
10	2943	62	Wf	12+3	8·5
10	2943	30	Bn	5−1, 7+1	8·3
14	2947	,,	D	7−1, 12+3	8·5
15	2948	,,	Bn	5−1, 7+1	8·3
16	2949	90	Bh	7+3	8·1
21	2954	40	Hw	=12	8·8
21	2954	55	Bo	7 (1) v (3) 12	8·5
21	2954	50	Bn	7 (1) v (1) 12	8·6
22	2955	25	AB	12−1, 19+3	9·0*b*
22	2955	30	D	7−3, 12+1	8·7
23	2956	62	Wf	12−3, 19+2	9·1
24	2957	25	AB	12−1, 19+2	9·0*b*
24	2957	90	Bh	7+2	8·2*b*
25	2958	,,	,,	7+1	8·3
25	2958	50	Ma	19+1, 20+3	9·2
26	2959	55	Bo	7 (3) v (1) 12	8·7
27	2960	50	Bn	7 (4) v (1) 12	8·7
27	2960	25	AB	12−3, 19+1	9·2*b*
27	2960	40	Hw	7 (5) v (5) 12	8·6
28	2961	30	D	12−1·5	9·0
30	2963	45	Bh	7−1, 12+3	8·5
Oct					
1	2964	55	Bo	7 (2) v (1) 12	8·7
1	2964	25	AB	12−3, 19+1	9·2
3	2966	62	Wf	20−1, 21+2	9·7
4	2967	50	Bn	12+2	8·6
4	2967	,,	Ma	12−1	8·9
5	2968	45	Bh	7−1	8·5
5	2968	25	AB	19−3, =20	9·6
5	2968	83	Li	7 (8) v (2) 12	8·7
6	2969	40	Hw	7 (5) v (5) 12	8·6
6	2969	55	Bo	7 (3) v (1) 12	8·7
8	2971	50	Bn	12+1, 19+3	8·9
9	2972	90	Bh	7−2, 12+2	8·6
9	2972	83	Li	7 (4) v (6) 9, 7 (5) v (5) 12	8·6

Aug. 25, Bh, Yellow. Ma, Orange.
Aug. 29, Pale yellow.
Aug. 30, Sept. 6, Bh, Yellow.
Sept. 10, 23, Oct. 3, Wf, 3-in.
Sept. 16, Orange.
Sept. 25, Ma, Pale red.
Oct. 4, Ma, Reddish.

1921					
Oct					
15	2978	55	Bo	7 (4) v (1) 12	8·
16	2979	50	Bn	=12	8·
17	2980	90	Bh	=12	8·
18	2981	40	Hw	19 (3) v (7) 25	9·
21	2984	62	Wf	20 (1) v (1) 26	10·
21	2984	55	Bo	12 (2) v (3) 17	9·
23	2986	50	Bn	17 (3) v (1) 21	9·
23	2986	37	Li	12 (2) v (8) 19, 16 (3) v (7) 18	9·
23	2986	90	Bh	12−4, =17	9·
29	2992	55	Bo	17 (3) v (1) 20	9·
31	2994	90	Bh	17−2	9·
Nov					
1	2995	50	Bn	21+1, 22+2	9·
6	3000	55	Bo	17 (1) v (3) 20	9·
6	3000	83	Li	19 (8) v (2) 25	10·
7	3001	80	AB	25+2	10·
7	3001	50	Bn	22+1·5	9·
10	3004	40	Hw	v (5) 25 (5) 29	10·
11	3005	55	Bo	20 (1) v (2) 21	9·
12	3006	90	Bh	19−5, 25+5	9·
17	3011	55	Bo	22 (1) v (1) 24	10·
20	3014	80	AB	=29	10·
22	3016	55	Bo	22 (1) v (1) 24	10·
22	3016	40	Hw	=25	10·
22	3016	90	Bh	19−6, 25+2	10·
24	3018	,,	,,	17−10, 25+3	10·
25	3019	140	Bo	24 (3) v (1) 25	10·
27	3021	120	Bn	25 (2) v (1) 29	10·
29	3023	90	Bh	=25	10·
Dec					
2	3026	,,	,,	=25	10·
3	3027	83	Li	29 (5) v (5) 25	10·
4	3028	90	Bh	25−2, 29+2	10·
9	3033	83	Li	29 (3) v (7) 33	11·
17	3041	40	Hw	29 (5) v (5) 30	11·
17	3041	140	Bo	29 (3) v (1) 30	11·
21	3045	90	Bh	=29	10·
22	3046	83	Li	29 (5) v (5) 32	11·
25	3049	90	Bh	=29	10·
25	3049	120	Bn	29 (2) v (1) 32	11·
26	3050	140	Bo	30 (1) v (2) 31	11·
28	3052	83	Li	31 (5) v (5) 32	11·
30	3054	90	Bh	=29	10·
31	3055	120	Bn	29 (3) v (1) 32	11·
1922					
Jan					
6	3061	140	Bo	30 (3) v (1) 31	11·
8	3063	90	Bh	29−2	11·
12	3067	160	Bo	30 (2) v (2) 31	11·
17	3072	55	,,	30 (3) v (1) 31	11·
18	3073	150	Wf	30 (1) v (1) 31	11·
18	3073	90	Bh	29−3	11·
20	3075	,,	,,	=29	10·
20	3075	40	Hw	25 (5) 29 (5) v	11·
29	3084	90	Bh	29−5	11·
30	3085	160	Bo	30 (2) v (2) 31	11·
31	3086	150	Wf	=31	11·
Feb					
1	3087	40	Hw	29 (5) v (5) 30	11·
5	3091	90	Bh	29−3, =30	11·

Oct. 21, Wf, 3-in.
Nov. 7, AB, With 25, 10·3.
Dec. 3. 29 considered brighter than 25.
Dec. 9, Orange.
Dec. 25, 31, Bn, t.

(5601) S URSÆ MINORIS—*continued.*

22						1922					
b						June					
5	3091	160	Bo	30 (1) v (3) 31	11·3	4	3210	45	Bh	7−1, 12+3	8·5
8	3094	,,	,,	30 (1) v (3) 31	11·3*b*	6	3212	25	Bn	7 (1) v (2) 12	8·5
0	3096	90	Bh	29−3, =30	11·2	10	3216	62	Wf	=7, 12+5	8·4*b*
3	3099	,,	Hw	25 (5) 29 (5) v	11·1*b*	12	3218	45	Bh	=7	8·4
3	3099	120	Bn	30 (1) v (1) 31	11·4*b*	17	3223	62	Wf	5−2, 7+2	8·3*b*
4	3100	140	Bo	30 (1) v (3) 31	11·3*b*	19	3225	55	Bo	3 (3) v (1) 5	8·1
7	3103	120	Bn	30 (1) v (1) 31	11·4	19	3225	90	Bh	=7	8·4
7	3103	45	Bh	29−2	11·0	21	3227	45	,,	7+1	8·3
7	3103	83	Li	29 (2) v (8) 32	11·1	24	3230	62	Wf	3−5, 7+1·5	8·3*b*
8	3104	140	Bo	30 (1) v (3) 31	11·3*b*	29	3235	45	Bh	7+3	8·1
9	3105	150	Wf	30−2, 31+3	11·4	July					
0	3106	83	Li	25 (4) v (6) 29	10·6	2	3238	62	Wf	3−4, 7+3	8·2*b*
5	3111	,,	,,	25 (5) v (5) 29	10·6	2	3238	90	Bh	7+3	8·1
5	3111	140	Bo	30 (1) v (3) 31	11·3	10	3246	45	,,	7+2	8·2
5	3112	120	Bn	30 (2) v (1) 31	11.5	14	3250	90	,,	7+4	8·0
5	3112	90	Bh	=29	10·8	19	3255	55	Bo	3 (3) v (1) 5	8·1*b*
8	3114	150	Wf	25+0·5	10·4	19	3255	30	Bn	=5, 6+2, 7+2	8·2
r						20	3256	90	Bh	7+4	8·0
2	3116	140	Bo	30 (2) v (2) 31	11·4*b*	23	3259	62	Wf	3−6, 7+3	8·3*b*
4	3118	120	Bn	29 (3) v (1) 30	11·1	27	3263	90	Bh	7+3	8·1
4	3118	90	Bh	=25	10·5	28	3264	30	Bn	5−1, 6+1, 7+1	8·3
4	3118	40	Hw	25 (5) 29 (5) v	11·1*b*	30	3266	62	Wf	=7, 12+4	8·4
8	3122	140	Bo	30 (1) v (3) 31	11·3*b*	31	3267	50	Ma	12+1	8·7
9	3123	120	Bn	29 (2) v (1) 30	11·1	31	3267	90	Bh	7+4	8·0
0	3124	90	Bh	25+1	10·4	31	3267	55	Bo	3 (3) v (1) 5	8·1
5	3129	62	Wf	25 (1) v (1) 26	10·6*b*	Aug					
5	3129	90	Bh	25+2, 29+5	10·3	7	3274	30	Bn	5−1, 6+2, 7+1	8·3
9	3130	140	Bo	25 (2) v (2) 29	10·6	11	3278	90	Bh	7+2	8·2
9	3133	90	Bh	25+2	10·3	14	3281	62	Wf	7+2, 12+6	8·2
:	3136	62	Wf	21−1, 25+3	10·1	16	3283	55	Bo	7 (1) v (3) 12	8·5
3	3137	55	Bo	24 (1) v (2) 25	10·3*b*	17	3284	50	Ma	7 (4) v (1) 12	8·7
5	3139	120	Bn	25+1	10·4	17	3284	90	Bh	=7	8·4
5	3142	90	Bh	25+3	10·2	20	3287	,,	,,	=7	8·4
	3145	62	Wf	=24	10·2*b*	20	3287	30	Bn	7 (1) v (2) 12	8·5
r						20	3287	55	Bo	7 (1) v (3) 12	8·5
	3146	50	Bn	22 (4) v (1) 25	10·4	21	3288	62	Wf	=7	8·4
9	3154	90	Bh	=21, =22, =24	10·0	23	3290	75	Bn	7 (2) v (1) 12	8·7
	3159	45	,,	=21, =23	10·0*b*	25	3292	90	Bh	7−1, 12+3	8·5
1	3161	55	Bo	20 (2) v (2) 22	9·8	31	3298	,,	,,	7−2, 12+2	8·6
,	3162	90	Bh	25+5	10·0	31	3298	30	Bn	=10, 12+1	8·8
4	3164	62	Wf	19−3, 25+9	9·6*b*	Sept					
4	3164	75	Bn	24 (1) v (2) 25	10·3*b*	7	3305	62	Wf	7 (1) v (1) 12	8·6
4	3165	55	Bo	20 (1) v (3) 22	9·7*b*	7	3305	45	Bh	7−3, 12+1	8·7
.	3168	90	Bh	21+1, 25+7	9·8	9	3307	75	Bn	12 (2) v (1) 19	9·1
1	3174	,,	,,	12−5, =17	9·3	11	3309	40	Hw	=12	8·8
1	3174	62	Wf	=20	9·6*b*	13	3311	62	Wf	12−3, 13−1, 17+3	9·0
y						15	3313	90	Bh	12−4	9·2
	3177	90	Bh	12−3, 17+1	9·1	16	3314	62	Wf	12−7, 19−4, 21+4	9·6*b*
	3179	55	Bo	7 (3) v (1) 12	8·7*b*	20	3318	50	Ma	12 (1) v (4) 25, 25+7	9·4
	3181	90	Bh	=17	9·2*b*	20	3318	,,	Bn	19 (2) v (1) 21	9·7
	3187	,,	,,	12−2, 17+2	9·0	21	3319	90	Bh	12−5, =19	9·3
	3187	62	Wf	7−2, 12+3	8·6	23	3321	45	,,	17+1	9·1*b*
	3189	55	Bo	7 (3) v (1) 12	8·7	23	3321	62	Wf	19 (1) v (1) 20	9·4*b*
	3194	62	Wf	7−1, 12+3	8·5	26	3324	50	Ma	12−5, 25+4	9·7*b*
	3195	55	Bo	7 (3) v (1) 12	8·7	29	3327	55	Bo	12 (2) v (3) 19	9·0
	3196	90	Bh	7−3, 12+1	8·7	29	3327	50	Bn	19 (4) v (1) 21	9·8
	3197	31	D	12−1, 19+4	8·9	30	3328	45	Bh	7−10, 17−2	9·4*b*
	3198	50	Bn	7 (4) v (1) 12, 10+1	8·7	Oct					
	3201	90	Bh	7−3, 12+1	8·7	4	3332	90	,,	12−8, 17−4	9·6
	3202	55	Bo	7 (2) v (2) 12	8·6	6	3334	,,	,,	17−4	9·6
	3202	50	Bn	7 (2) v (1) 12	8·7	6	3334	50	Bn	=21	9·9
	3203	62	Wf	7−1·5, 12+3	8·5	7	3335	90	Hw	20 (7) v (3) 25	10·2
	3206	90	Bh	7−2, 12+2	8·6*b*	8	3336	157	Wf	20−3, 25+6	9·9
						11	3339	90	Bh	12−10, 19−5	9·8
						12	3340	,,	,,	19−6, 25+6	9·9
						12	3340	50	Bn	=24	10·2
						13	3341	55	Bo	22 (1) v (1) 24	10·1*b*
						13	3341	90	Bh	19−8, 25+4	10·1

ar. 31, Reddish with 150.
ay 27, Bn, With 30, 8·7.
ay 28, Red.

(5601) S URSÆ MINORIS—*continued.*

1922 Oct					
14	3342	90	Bh	25+5	10·0
15	3343	50	Bn	22 (1) v (1) 24	10·1
15	3343	62	Wf	20−4, 25+4	10·0
16	3344	40	Hw	=25	10·5
16	3344	90	Bh	19−6, 25+6	9·9
18	3346	,,	,,	19−9, 25+3	10·2
20	3348	,,	,,	=25	10·5
21	3349	,,	,,	19−10, 25+2	10·3
22	3350	50	Bn	24 (2) v (1) 25	10·4
25	3353	,,	,,	25+1	10·4
25	3353	140	Bo	29 (2) v (2) 30	11·0*b*
25	3353	90	Bh	21−1, 25+3·5	10·1
27	3355	,,	,,	=25	10·5
28	3356	40	Hw	=25	10·5
Nov					
1	3360	120	Bn	25+1	10·4
1	3360	90	Bh	=25	10·5
4	3363	,,	,,	25−1, 29+2	10·6
9	3368	,,	,,	25−1, 29+2	10·6
11	3370	,,	,,	19−10, 25+1	10·3
15	3374	40	Hw	25 (5) v (5) 29	10·6*b*
15	3374	120	Bn	=30	11·2
17	3376	90	Bh	=25	10·5
18	3377	,,	,,	25+1	10·4
19	3378	,,	,,	25−1	10·6
24	3383	,,	,,	25−3, 29+1	10·7
24	3383	120	Bn	30 (2) v (1) 31	11·5
25	3384	140	Bo	29−3	11·1*b*
Dec					
5	3394	90	Bh	=29	10·8
11	3400	,,	,,	=29, 30+3	10·9
14	3403	,,	Hw	=30	11·2
16	3405	55	Bo	32 (2) v (1) 33	12·4
17	3406	90	Bh	25−3	10·8
19	3408	120	Bn	30 (3) v (1) 31	11·5
20	3409	55	Bo	32 (2) v (1) 33	12·4
23	3412	90	Bh	25−3, =29	10·8
26	3415	,,	Hw	=30	11·2*b*
28	3417	,,	Bh	25−5, 29−1	10·9
30	3419	140	Bo	32 (1) v (2) 33	12·3
1923 Jan					
6	3426	94	Li	29 (4) v (6) 32	11·4
6	3426	90	Bh	25−5, 29−1	10·9
11	3431	,,	,,	=29	10·8
14	3434	,,	,,	29−2	11·0
14	3434	120	Bn	30 (3) v (1) 31	11·5
16	3436	90	Hw	=31	11·6
20	3440	,,	Bh	29−2	11·0
20	3440	94	Li	=29	10·8
23	3443	157	Wf	25−2, 29+1	10·7
24	3444	120	Bn	30 (2) v (1) 31	11·5
27	3447	90	Bh	=29	10·8*b*
Feb					
4	3455	,,	,,	25−1	10·6
4	3455	50	Bn	30 (1) v (1) 31	11·4
5	3456	40	Hw	=30	11·2*b*
7	3458	62	Wf	25−0·5, 29+2	10·6
8	3459	90	Bh	=25	10·5
23	3474	,,	,,	25+3	10·2
23	3474	40	Hw	<29	<10·8*b*

Bh records for 1922 as a whole :—"Colour generally 8."
Jan. 6, Li, Difficult.
Jan. 14, Bn, t.

1923 Mar					
2	3481	90	Bh	19−6, 25+6	
5	3484	,,	,,	19−5, 25+7	
6	3485	50	Bn	16 (7) v (1) 22	
13	3492	90	Bh	=17, 19+1	
17	3496	,,	,,	=17	
17	3496	50	Bn	16−5, 22+1	
17	3496	90	Hw	v (5) 25 (5) 29	1
18	3497	79	Ma	12−5, 25+7	
18	3497	34	Li	12 (3) v (7) 19	
24	3503	,,	,,	=12	
24	3503	50	Bn	16 (3) v (2) 22	
25	3504	90	Bh	17+1	
26	3505	,,	Hw	19 (5) v (5) 20	
Apr					
3	3513	50	Bn	12 (1) v (2) 19	
6	3516	62	Wf	7−4, 12+1	
8	3518	30	Bn	=12	
8	3518	34	Li	7 (5) v (5) 9	
8	3518	90	Bh	=17	
10	3520	62	Wf	7−2, 12+2	
13	3523	30	Bn	7 (2) v (1) 12	
13	3523	90	Bh	7+1	
14	3524	34	Li	7 (2) v (8) 9	
14	3524	30	D	12−1, 19+5	
14	3524	50	Ma	=7	
15	3525	62	Wf	7−4, =12	
20	3530	30	Bn	7 (3) v (1) 12	
20	3530	,,	D	=12	
20	3530	90	Bh	7+2	
23	3533	,,	,,	7+3	
24	3534	75	Bn	7 (3) v (2) 12	
26	3536	50	Ma	7 (3) v (1) 12	
27	3537	30	D	7−3, 12+1	
May					
1	3541	90	Bh	7+2	
5	3545	50	Bn	5−2, =7	
7	3547	62	Wf	7−1, 12+3	
9	3549	50	Ma	7 (1) v (3) 12	
9	3549	90	Bh	7+2	
10	3550	30	D	7−4, 12+2	
12	3552	34	Li	=7	
13	3553	30	D	7−3, 12+2	
16	3556	,,	Bn	5+1, 7+2	
20	3560	62	Wf	=12	
21	3561	25	Bn	5+1, 7+2·5	
21	3561	90	Bh	7−1	
24	3564	30	D	7−2, 12+2	
30	3570	34	Li	3 (8) v (2) 7	
June					
2	3573	,,	,,	=7	
3	3574	62	Wf	7−3, 12+1	
6	3577	30	D	7−1, 12+3	
10	3581	,,	,,	7−3, 12+2	
11	3582	,,	Bn	5 (1) v (1) 7	
11	3582	90	Bh	=7	
18	3589	30	D	7−4, 12+2	
21	3592	90	Bh	7−2	
26	3597	30	D	=12	
July					
4	3605	,,	,,	12−1	
4	3605	25	Bn	7 (5) v (2) 12	
5	3606	90	Bh	7−4, =12, 17+4	
6	3607	30	D	12−1, 19+4	

Mar. 18, Ma, Slightly red.
April 26, Red.
June 18, 5c.

(5601) S URSÆ MINORIS—*continued.*

					1923						
					Nov						
3609	62	Wf	7−5, 12−1	8·9	7	3731	90	Bh	=30	11·2	
3613	30	D	12−3, 19+1	9·2	10	3734	,,	,,	29−4, 30−1	11·3	
3616	62	Wf	19−2, =20	9·5*b*	10	3734	,,	Hw	=31	11·6*b*	
3617	30	D	=19	9·3	16	3740	120	Bn	30 (3) v (1) 31	11·5	
3618	34	Li	7 (7) v (3) 12	8·7	19	3743	90	Bh	=30, =31	11·4*b*	
3621	90	Bh	12−1	8·9	30	3754	,,	,,	30−2, 31+2	11·4*b*	
3622	75	Bn	12 (2) v (1) 18	9·1	Dec						
3622	34	Li	7 (7) v (3) 12	8·7	1	3755	,,	,,	=30	11·2	
3623	150	Wf	19−5, 25+6	9·8	3	3757	120	Bn	31 (1) v (1) 32	11·9	
3629	50	Bn	12+1	8·7	4	3758	40	Hw	=25	10·5	
3631	90	Bh	7−5, 12−1	8·9	4	3758	90	Bh	25−6, 29−2	11·0	
					8	3762	,,	,,	25−5, 29−2	11·0*b*	
3635	,,	,,	12−2, 17+2	9·0	11	3765	157	Wf	30−4, =31	11·6	
3635	120	Ga	=16, 23+5	9·4	12	3766	90	Bh	=29	10·8*b*	
3636	50	Bn	12 (2) v (1) 19	9·1	18	3772	,,	,,	25−4, 29−1	10·9	
3638	150	Wf	19−6, 25+5	9·9	20	3774	120	Bn	30 (4) v (1) 31	11·5*b*	
3641	90	Bh	=17	9·2	24	3778	90	Bh	25−2, 29+1	10·7	
3644	150	Wf	25+3, 26+5	10·2	28	3782	,,	,,	25−1, 29+3	10·5	
3645	50	Bn	19+1	9·2	31	3785	45	,,	25−1	10·6	
3647	90	Bh	=19, 25+10	9·4	1924						
3658	,,	,,	25+6	9·9	Jan						
3661	150	Wf	25+3, 29+6	10·2	2	3787	120	Bn	29 (2) v (1) 30	11·1	
3662	50	Bn	24 (1) v (3) 25	10·3	3	3788	90	Bh	25+1	10·4	
3662	90	Bh	=22, 25+5	10·0	5	3790	,,	Hw	29 (5) v (5) 30	11·0*b*	
					5	3790	60	D	29−5	11·3*b*	
3665	120	D	25−2, 29+1	10·7*b*	6	3791	120	Bn	29 (1) v (3) 30	10·9	
3668	60	Ga	25+3	10·2	7	3792	90	Bh	25+3	10·2	
3668	120	Bn	=25	10·5	11	3796	,,	,,	25+3	10·2	
3669	157	Wf	25+1, 29+4	10·4	16	3801	,,	,,	17−7, 25+5	9·9	
3669	79	Ma	25+1	10·4	23	3808	,,	,,	17−5, 25+7	9·7	
3670	90	Bh	25+2	10·3	23	3808	94	Bl	=20	9·6	
3671	120	D	25−2, 29+1	10·7*b*	25	3810	90	Hw	v (5) 25 (5) 29	10·2*b*	
3674	,,	Bn	25 (1) v (1) 29	10·6	25	3810	120	Bn	25+1·5	10·3*b*	
3676	150	Wf	=25, 29+3	10·5	27	3812	50	,,	22 (1) v (1) 24	10·1	
3676	90	Bh	25+1	10·4	Feb						
3679	79	Ma	25 (2) v (1) 29, 25−2	10·7	1	3817	,,	,,	22+2, 24+3	9·9	
3679	120	Bn	25 (2) v (1) 29	10·7	1	3817	60	D	21−3, 25+3	10·2	
3680	40	Hw	v (5) 25 (5) 29	10·2	2	3818	94	Bl	12 (5) v (1) 20, =19	9·4	
3685	90	Bh	25−2, 29+1	10·7	4	3820	90	Bh	17−3	9·5	
3689	,,	,,	25−3, =29	10·8	6	3822	79	Ma	25+4	10·1	
3693	120	D	30−1, 31+3	11·3*b*	8	3824	30	D	=21	9·9	
3693	157	Wf	29−3, 30+1	11·1	8	3824	40	Hw	=25	10·5	
					8	3824	62	Wf	20−1, 25+7	9·7	
3694	90	Bh	25−5, 29−2	11·0	11	3827	90	Bh	12 (1) v (1) 17	9·0	
3695	60	Ga	25−10, =31	11·5	14	3830	30	D	19−2, 21+4	9·5	
3697	120	Bn	30 (1) v (1) 31	11·4	14	3830	94	Bl	7 (3) v (2) 12	8·6	
3697	40	Hw	=25	10·5	16	3832	50	Bn	16 (1) v (3) 22	9·4	
3697	90	Bh	25−3, 29−1	10·8	18	3834	90	Bh	12−2	9·0	
3701	157	Wf	30−3, =31	11·6	21	3837	,,	,,	12−1	8·9	
3702	90	Bh	29−1	10·9	24	3840	,,	,,	=12	8·8	
3705	60	Ga	=32	12·2	24	3840	50	Bn	12 (2) v (1) 16	9·1	
3707	120	Bn	30 (3) v (1) 31	11·5	26	3842	90	Bh	12+1	8·7	
3708	,,	D	31−4, =32	12·1*b*	28	3844	30	D	12 (1) v (2) 13	8·8	
3708	40	Hw	=25	10·5	Mar						
3714	90	Bh	29−2, 30+2	11·0	1	3846	45	Bh	7 (3) v (1) 12	8·7	
3718	,,	,,	29−3, 30+1	11·1	4	3849	90	,,	7 (1) v (1) 12	8·6	
3719	,,	Hw	=31	11·6	4	3849	50	Bn	7−5, 12+1	8·8	
3721	157	Wf	30 (1) v (1) 31	11·4	4	3849	30	D	12−2, 19+3	9·0	
					5	3850	40	Hw	7 (5) v (5) 12	8·6	
3725	90	Bh	=30	11·2*b*	7	3852	90	Bh	7 (1) v (1) 12	8·6	
3727	120	Bn	30 (3) v (1) 31	11·5	8	3853	50	Bn	7 (3) v (2) 12	8·6	
					8	3853	30	D	=12	8·8	
					8	3853	50	Ma	7 (3) v (1) 12	8·7	

uly 21, Li, 5c.
ept. 5, Ga, T.
ept. 30, D, Difficult.
)ct. 2, 12, T.
)ct. 15, D, About.

Jan. 5, D, Difficult.
Feb. 6, Mar. 8, Ma, Pale red.
Feb. 14, Bl, With 22, 8·9.

(5601) S URSÆ MINORIS—*continued.*

1924					
Mar					
9	3854	22	Bl	7 (4·5) v (1·5) 12	8·7
11	3856	30	D	7−4, 12+1	8·8
11	3856	90	Bh	7−1	8·5
12	3857	30	Bn	7 (5) v (2) 12	8·7
15	3860	90	Bh	7−1	8·5
19	3864	,,	,,	=7	8·4
19	3864	50	Bn	7 (3) v (1) 12	8·7
20	3865	22	Bl	7 (1) v (5) 12	8·5
22	3867	90	Bh	7+1	8·3
24	3869	40	Hw	=12	8·8
24	3869	50	Ma	7 (1) v (1) 12	8·6
26	3871	90	Bh	7+2	8·2
29	3874	,,	,,	=7	8·4
29	3874	25	Bn	7+1	8·3
30	3875	30	D	7−3, 12+3	8·6
30	3875	22	Bl	7 (1) v (3) 12	8·5
Apr					
1	3877	50	Bn	3 (4) v (1) 7	8·3
2	3878	90	Bh	7+2	8·2
4	3880	25	Bn	7 (3) v (1) 12	8·7
4	3880	30	D	7−4, 12+3	8·7
5	3881	50	Ma	7−0·5	8·5
5	3881	40	Hw	7 (5) v (5) 12	8·6
6	3882	90	Bh	7 (1) v (3) 12	8·5
8	3884	,,	,,	=7	8·4
9	3885	25	Bn	7 (1) v (1) 12	8·6
10	3886	30	D	7−3, 12+2	8·7*b*
11	3887	90	Bh	7 (1) v (3) 12	8·5
14	3890	,,	,,	7 (1) v (2) 12	8·5
17	3893	22	Bl	4−4, =7	8·4
20	3896	50	Bn	7 (1) v (1) 12	8·6
20	3896	45	Bh	=7	8·4
24	3900	90	,,	7 (1) v (2) 12	8·5
24	3900	62	Wf	7−1, 12+3	8·5
26	3902	90	Bh	7−1	8·5
May					
1	3907	50	Ma	7+1	8·3
1	3907	,,	Bn	3 (4) v (1) 7	8·3
4	3910	30	D	7−1, 12+3	8·5
5	3911	90	Bh	7+1	8·3
7	3913	30	D	7−1, 12+3	8·5
7	3913	62	Wf	7−1, 12+3	8·5
7	3913	50	Bn	3 (4) v (1) 7	8·3
12	3918	62	Wf	=7, 12+5	8·4
13	3919	90	Bh	7+1	8·3
13	3919	30	D	7−2, 12+2	8·6
13	3919	22	Bl	=7	8·4
16	3922	50	Bn	7 (1) v (3) 12	8·5
18	3924	45	Bh	=7	8·4
21	3927	30	D	7−2, 12+2·5	8·6
22	3928	90	Bh	=7	8·4
23	3929	62	Wf	12−2, 19+3	9·0
24	3930	30	D	7−3, 12+2	8·7
26	3932	90	Bh	=7	8·4
26	3932	94	Bl	7 (1) v (3) 12	8·5
27	3933	30	D	7−4, 12+1	8·8
27	3933	50	Bn	7 (1) v (1) 12	8·6
28	3934	90	Bh	=7	8·4
30	3936	30	D	7−4, 12+1	8·8
June					
1	3938	,,	,,	7−4, 12+1	8·8
2	3939	62	Wf	7−3, 12+1	8·7

Mar. 24, Ma, Slightly red.
April 5, Ma, Reddish.
May 1, Ma, Pale red.
May 4, 5^{c}.

1924					
June					
5	3942	30	D	=12	
5	3942	94	Bl	=7	
11	3948	90	Bh	7−3	
12	3949	30	D	=12	
13	3950	90	Bh	=12	
16	3953	30	D	=12	
16	3953	94	Bl	7 (3) v (3) 12	
18	3955	90	Bh	7−5, 12−1	
22	3959	62	Wf	12−5, 19−1	
22	3959	30	D	12−3, 19+2	
26	3963	,,	,,	=19	
26	3963	62	Wf	19−5, 25+5	
29	3966	22	Bl	12 (4) v (1) 19	
30	3967	30	D	19−1	
30	3967	90	Bh	12−2	
30	3967	62	Wf	19−7, 25+5	
July					
6	3973	150	,,	25+4, 29+7	
6	3973	30	D	19−5, 21+1	
9	3976	,,	,,	21−1	
9	3976	90	Bh	17−1, =19	
9	3976	79	Ma	25+2	
10	3977	50	Bn	12−4, 18+0·5	
10	3977	157	Wf	25+4, 29+7	
10	3977	94	Bl	12 (2) v (2) 17	
13	3980	60	D	21+1	
19	3986	79	Ma	25+2·5	
20	3987	157	Wf	25+2, 29+5	
24	3991	150	,,	25+1, 29+3	
24	3991	50	Bn	22−2·5, 24−1, 25+4	
24	3991	90	Bh	19 (1) v (1) 25	
29	3996	,,	,,	25+3	
29	3996	79	Ma	=25	
30	3997	120	Bn	25 (2) v (1) 29	
30	3997	150	Wf	=25, 29+2	
Aug					
5	4003	62	,,	25−0·5, 29+2	
5	4003	120	Bn	25 (3) v (1) 29	
5	4003	45	Bh	25+1	
7	4005	90	,,	=25	
7	4005	79	Ma	21 (1) v (3) 29	
10	4008	120	D	31−2, 32+2	
11	4009	94	Bl	23 (2) v (2) 25	
17	4015	120	D	30−3, 31+1	
18	4016	79	Ma	25−1, 29+0·5	
19	4017	90	Bh	25−3, =29	
22	4020	157	Wf	30−2, =31	
26	4024	90	Bh	29−2	
27	4025	157	Wf	30−2, 31+1	
27	4025	120	D	31−3, 32+3	
28	4026	90	Bh	25−6, 29−2, =30	
Sept					
2	4031	,,	,,	25 (1) v (1) 33, 30 (1) v (1) 32	
3	4032	157	Wf	30−4, 31−1	
6	4035	94	Bl	30 (3) v (1) 32	
8	4037	90	Hw	<30	<1
9	4038	150	Bn	=31	
9	4038	79	Ma	25−4, =31	
9	4038	90	Bh	30 (2) v (1) 32	
10	4039	150	Wf	32−1, 33+2	
16	4045	90	Bh	30 (3) v (1) 32, 32+2	

June 5, Bl, With 22, 8·7.
June 16, Bl, With 22, 8·8.
July 19, Reddish.

(5601) S URSÆ MINORIS—*continued.*

1924						1924					
Sept						Nov					
2	4051	120	D	m+4	11·8	15	4105	90	Bh	25−1	10·6
2	4051	94	Bl	30 (3) v (1) 32	12·0	15	4105	94	Bl	24 (1) v (1) 25	10·3
6	4055	150	Wf	32−2, 33+2	12·4	17	4107	34	Li	24 (5) v (5) 25	10·3
7	4056	,,	Bn	31 (2) v (1) 32	12·0	24	4114	90	Bh	25+1	10·4
9	4058	94	Bl	32 (1·5) v (3·5) 33	12·3	27	4117	150	Bn	25 (2) v (1) 29	10·7
Oct						27	4117	94	Bl	=25	10·5
5	4064	157	Wf	32−2, =33	12·5	29	4119	90	Bh	19 (2) v (1) 25	10·1*b*
8	4067	90	Bh	30 (1) v (1) 32, =31	11·7	30	4120	120	D	25−1	10·6
11	4070	,,	,,	30 (1) v (1) 32, =31	11·7	Dec					
11	4070	94	Bl	30 (2) v (2) 31	11·4	3	4123	34	Li	20 (3) v (7) 21	9·7
15	4074	90	Bh	30 (3) v (2) 32	11·8	5	4125	90	Bh	19 (1) v (2) 25	9·7
16	4075	157	Wf	=32, 33+2	12·3	5	4125	150	Bn	25+1	10·4
23	4082	150	Bn	31−2, 32+1·5	11·9	6	4126	34	Li	=20	9·6
24	4083	90	Bh	=31	11·6	10	4130	,,	,,	=20	9·6
27	4086	150	,,	30 (1) v (1) 31	11·4*b*	14	4134	90	Bh	=19	9·3
31	4090	,,	,,	=30	11·2	15	4135	34	Li	12 (8) v (2) 19	9·2
Nov						19	4139	90	Bh	17 (1) v (1) 19	9·3
3	4093	90	,,	25−6, 29−3	11·1	22	4142	94	Bl	12 (5) v (1) 19, =18	9·3
3	4093	94	Li	25 (3) v (7) 29	10·6	24	4144	90	Bh	17−1	9·3
3	4093	,,	Bl	25−3, 29+1, =30	10·9	26	4146	50	Bn	22 (1) v (1) 24	10·1
8	4098	79	Ma	=30	11·2*b*	28	4148	90	Bh	17−1, =19	9·3
8	4098	90	Bh	25 (2) v (1) 29	10·7	30	4150	60	D	19−4, 21+2	9·7
						30	4150	50	Bn	22+1	9·9
						31	4151	90	Bh	17−1, =19	9·3*b*

Nov. 8, Ma, About.

(4847) S VIRGINIS. (V. 2.)

H.D. *132706*.

Date.	Julian Date.	Inst.	Observer.	Comparisons.	Deduced Mag.
1920					
Jan.					
1	2325	30	Bn	5 (7) v (1) 8, 6 (4) v (1) 7	9·4
5	2329	90	Bh	4−5, =5, =6, 7+5	9·0
8	2332	75	Bn	5 (1) v (4) 8	9·1
14	2338	45	Bh	4−1, 5+5	8·5
16	2340	90	,,	3−4, 4+2	8·2
16	2340	30	D	=g	7·9*c*
19	2343	,,	Bn	3+1	7·7
21	2345	45	Bh	2−7, 3+3	7·5
22	2346	90	,,	2−5, 3+5	7·3
24	2348	,,	,,	=2	6·8
26	2350	45	,,	2+1	6·7
26	2350	30	Bn	2 (3) v (1) 3	7·6
28	2352	,,	D	e−3, g+3	7·6*c*
31	2355	,,	Bn	2 (2) v (1) 3	7·5
Feb.					
5	2360	45	Bh	2+2	6·6
10	2365	,,	,,	2+1	6·7
11	2366	,,	,,	2+2	6·6
15	2370	,,	,,	2−1	6·9
16	2371	30	D	2−6, g+5	7·4

Jan. 24, Yellow.
Feb. 5, 10, Orange.
Feb. 15, Pale yellow.

Date.	Julian Date.	Inst.	Observer.	Comparisons.	Deduced Mag.
1920					
Feb.					
17	2372	45	Bh	2−2	7·0
23	2378	,,	,,	2−3, 3+7	7·1
27	2382	,,	,,	=2, 3+8	6·9
29	2384	,,	,,	=2	6·8
Mar.					
4	2388	,,	,,	=2	6·8
7	2391	90	,,	2−3, 3+7	7·1
8	2392	30	Bn	3+2	7·6
11	2395	45	Bh	2−6, 3+3	7·5
12	2396	90	,,	2−8, 3+2	7·6
12	2396	30	Bn	3+2	7·6
16	2400	62	Th	4+5	7·9*b*
17	2401	90	Bh	3−2, 4+4	8·0*b*
18	2402	,,	,,	3+1	7·7
18	2402	30	D	g−1, 4+4	8·0*b*
18	2402	,,	Bn	3+1	7·7
21	2405	90	Bh	3−1, 4+4	8·0
22	2406	45	,,	3−3, 4+3	8·1
22	2406	30	Bn	=3	7·8
23	2407	,,	D	4+0·5	8·4
25	2409	90	Bh	3−4, 4+2	8·2
30	2414	30	D	4−1, 6+5	8·5*b*
31	2415	45	Bh	3−3, 4+2	8·2

Feb. 23, Pale yellow.

(4847) S VIRGINIS—*continued.*

1920 Apr					
10	2425	90	Bh	4−2, 5+4	8·6
12	2427	,,	,,	4−3, 5+3	8·7
13	2428	30	D	4−5, 6+2	8·9
16	2431	62	Th	6+2	8·8
16	2431	90	Bh	=5, =6	9·0
21	2436	,,	,,	=6	9·0
23	2438	30	D	6−1, 8+3	9·1*b*
27	2442	75	Bn	5 (2) v (1) 7	9·4
27	2442	90	Bh	=5, =6	9·0
May					
4	2449	,,	,,	6−2, 8+2	9·2
7	2452	,,	,,	=7, =8	9·5
7	2452	75	Bn	7 (1) v (1) 10	9·8
7	2452	60	D	8−2, 14+4	9·6*b*
9	2454	30	,,	8−4, 14+2	9·8
12	2457	,,	,,	8−4, 14+2	9·8
13	2458	90	Bh	=7, =8	9·5
14	2459	50	Bn	7 (3) v (2) 10	9·9
20	2465	25	Wd	8 (5) v (5) 12	9·9
21	2466	50	Bn	10 (1) v (1) 11	10·2
21	2466	90	Bh	=7, 8−2	9·6
June					
2	2478	45	,,	7−3	9·9
4	2480	90	,,	8−5, 12+5	9·9
5	2481	120	Bn	12 (1) v (1) 16	10·6
8	2484	60	D	=18	11·3*b*
9	2485	50	Bn	16 (2) v (1) 18	11·1
11	2487	25	Wd	12 (5) v (5) 15	10·8
July					
12	2518	,,	,,	<15	<11·1
Aug					
3	2540	,,	,,	<15	<11·1
17	2554	,,	,,	<15	<11·1*b*
Oct					
28	2626	90	Bh	<7	<9·6
Nov					
1	2630	150	,,	11−5, 12−4	10·9
8	2637	,,	,,	12−2	10·7
11	2640	90	,,	12−2, 14−5	10·6*b*
16	2645	,,	,,	12+2	10·3
20	2649	,,	,,	8−5, 12+5	9·9
30	2659	,,	,,	8−2, 7−1	9·6
Dec					
7	2666	45	,,	=7, =8	9·5*b*
12	2671	90	,,	8+2, 7+4	9·2
21	2680	,,	,,	=5, =6	9·0
31	2690	45	,,	4−2, 5+3	8·7
1921 Jan					
6	2696	,,	,,	=5, =6	9·0*b*
10	2700	90	,,	4−4, 5+2	8·8
10	2700	75	Bn	4 (1) v (4) 5	8·5
13	2703	90	Bh	4+1	8·3
27	2717	45	,,	2−4, 3+6	7·2*b*
30	2720	,,	,,	2−1	6·9
31	2721	50	Bn	2+1	6·7
Feb					
2	2723	90	Bh	2+2	6·6
9	2730	45	,,	2+4	6·4
17	2738	,,	,,	=1, 2+6	6·1
17	2738	50	Bn	2+2	6·6
20	2741	45	Bh	2+5	6·3*b*
1921 Feb					
21	2742	45	Bh	=1, 2+5	6·
25	2746	,,	,,	2+5	6·
Mar					
1	2750	30	Bn	2−2	7·
2	2751	45	Bh	1−1, 2+6	6·
6	2755	,,	,,	=2	6·
10	2759	32	Ca	2−1, 3+9	6·
11	2760	45	Bh	2+3	6·
16	2765	,,	,,	2+1	6·
18	2767	30	Bn	e (3) v (1) f, 3+2·5	7·
21	2770	45	Bh	=2	6·
24	2773	,,	,,	2−2	7·
26	2775	30	Bn	2 (4) v (1) f, 3+2·5	7·
28	2777	32	Ca	2−5, 3+5	7·
29	2778	45	Bh	2−4, 3+6	7·
Apr					
1	2781	,,	,,	2−6, 3+4	7·
1	2781	30	Bn	f−2, 3−0·5	7·
3	2783	,,	D	g−3, 4+2	8·
4	2784	45	Bh	2−7, 3+3	7·
7	2787	,,	,,	3+2	7·
8	2788	30	D	g−4, 4+1	8·
12	2792	,,	Bn	3 (3) v (1) 4	8·
12	2792	45	Bh	3−2, 4+4	8·
15	2795	90	,,	=3	7·
15	2795	30	D	4−1, 6+5	8·
23	2803	45	Bh	3−4, 4+2	8·
25	2805	,,	,,	3−3, 4+3	8·
27	2807	,,	,,	3−6, 4−1	8·
27	2807	30	D	4−5, 6+1	8·
29	2809	50	Bn	=5, =6	9·
May					
7	2817	45	Bh	=5, =6	9·
8	2818	75	Bn	5 (2) v (1) 7	9·
9	2819	90	Bh	=6	9·
15	2825	,,	,,	6−2, 7+4, 8+7	9·
21	2831	50	Bn	6 (4) v (1) 8	9·
23	2833	90	Bh	6−4, 8−1, =7	9·
28	2838	30	D	8−3	9·
June					
2	2843	90	Bh	7−3	9·
6	2847	50	Bn	11 (2) v (1) 12	10·
9	2850	32	Ca	11−1, 12+1	10·
29	2870	80	,,	15−2, 19+3	11·
29	2870	150	Bn	12 (4) v (1) 18, 16−3	11·
Aug					
6	2908	80	Ca	Estimated	<12
Oct					
17	2980	90	Bh	<24	<12
Nov					
12	3006	,,	,,	19−5	12·
24	3018	,,	,,	18−3, 19−1	11·
Dec					
15	3039	,,	,,	14−5, =12	10·
23	3047	75	Bn	12 (1) v (2) 16	10·
25	3049	90	Bh	7−4, =14, 12+5	10·
30	3054	,,	,,	8−6, 7−4, 12+5	10·
1922 Jan					
3	3058	30	Bn	10 (1) v (1) 11	10·
10	3065	90	Bh	5−5, 7−2	9·
18	3073	45	Bh	=8	9·
21	3076	90	,,	=6, =7	9·

June 8, About. Difficult.
July 12, Aug. 3, Invisible.
Aug. 17, Doubtfully seen. Perhaps 11·5 mag.
Feb. 17, Bn, With 30, 6·6.

May 9, Yellow.
Aug. 6, Invisible.
Oct. 17, Not seen.

(4847) S VIRGINIS—*continued.*

1922 Feb					
2	3088	45	Bh	=4	8·4
17	3103	,,	,,	2−3, 3+5	7·2*b*
20	3106	,,	,,	2+2	6·6
22	3108	32	Ca	e−4, 3+1	7·7
22	3108	F	Wf	2 (4) v (1) 3	7·6
25	3111	30	D	2 (4) v (1) g, g+3	7·7
26	3112	45	Bh	2+1	6·7
28	3114	62	Wf	2 (4) v (1) 3	7·6*b*
Mar					
3	3117	32	Ca	e−3, 3+2	7·6
4	3118	45	Bh	2−2	7·0
5	3119	62	Wf	2 (2) v (3) 3	7·2*b*
17	3131	32	Ca	=3, 4+6	7·8
17	3131	45	Bh	3+4	7·4
19	3133	,,	,,	3+3	7·5
19	3133	62	Wf	2 (1) v (1) 3	7·4
25	3139	30	Bn	3 (4) v (1) 4	8·3
26	3140	62	Wf	3+0·5	7·8*b*
28	3142	90	Bh	3+1	7·7
30	3144	32	Ca	3−1, 4+5	7·9
Apr					
1	3146	30	Bn	3 (4) v (1) 4	8·3
4	3149	F	Wf	3−4, 4+2	8·2
4	3149	90	Bh	=3	7·8
17	3162	,,	,,	4+1	8·3
17	3162	32	Ca	4−1, 5+4	8·6
19	3164	30	Bn	4+1	8·3
19	3164	62	Wf	4−1·5, 5+4·5	8·6
19	3164	33	Wi	4−1, 6+5	8·5
20	3165	,,	,,	4−2, 6+4	8·6
21	3166	,,	,,	=4, 6+5	8·5
23	3168	90	Bh	4−2, 5+2	8·7*b*
24	3169	33	Wi	4−1, 6+5	8·5
26	3171	32	Ca	4−2, 5+2	8·7
29	3174	62	Wf	4−3, 6+2	8·8
29	3174	90	Bh	6+1	8·9
May					
2	3177	,,	,,	=5, =6	9·0
4	3179	120	Wi	6+2, 7+7	8·8
5	3180	32	Ca	=5, =6	9·0
6	3181	90	Bh	5−1, 7+3	9·2
12	3187	,,	,,	=7	9·6
12	3187	62	Wf	5−4, 6+2	9·1
12	3187	120	Wi	4−4, 7+4	9·0
14	3189	44	,,	6−2, 7+3	9·2
15	3190	50	Bn	6 (4) v (1) 7	9·5
16	3191	32	Ca	6−2, 8+2	9·2
17	3192	90	Bh	=8, 7+1	9·4
19	3194	120	Wi	6−5, 7+3	9·4
19	3194	62	Wf	6−2, 7+2	9·3
20	3195	31	D	6−3, 8+1	9·3
21	3196	120	Wi	6−6, =7	9·6
21	3196	50	Bn	=7	9·6
22	3197	31	D	=8	9·4
27	3202	90	Bh	=8, =7	9·5
28	3203	31	D	8−3, 14+4	9·6
28	3203	62	Wf	=7	9·6
30	3205	32	Ca	8−1, 9+5	9·5*b*
June					
1	3207	50	Bn	8−1	9·5
4	3210	90	Bh	=11, 12+2	10·3
10	3216	62	Wf	8−7, 11+1, 12+2	10·2*b*
16	3222	90	Bh	12−2	10·7*b*
1922 June					
17	3223	62	Wf	12−1, 16+2	10·6
23	3229	32	Ca	12−2, 15+3	10·7*b*
24	3230	62	Wf	12−3, 18+4	10·8
July					
16	3252	80	Ca	18−8, =24	12·1
Oct					
14	3342	90	Bh	<24	<12·1
Nov					
14	3373	,,	,,	12−10, 16−8	11·5
20	3379	45	,,	16−5	11·2
24	3383	90	,,	12−5	11·0
Dec					
6	3395	,,	,,	14−10, 12−3	10·9
11	3400	,,	,,	10−3, =12	10·4*b*
16	3405	,,	,,	12−2, =16	10·7
23	3412	,,	,,	=12	10·5
25	3414	,,	,,	=12	10·5
1923 Jan					
4	3424	,,	,,	8−8, 12+4	10·1
11	3431	,,	,,	6−10, 7−5	10·0
19	3439	62	Wf	11 (1) v (1) 12	10·4*b*
20	3440	30	Bn	=10	10·1
26	3446	32	Ca	7 (2) v (2) 14	9·8
27	3447	90	Bh	=7	9·6
Feb					
4	3455	,,	,,	=8, 7+2	9·4
7	3458	62	Wf	6−2, 7+2	9·3
8	3459	32	Ca	=5	9·0
8	3459	45	Bh	5−3, 7+3	9·3
16	3467	,,	,,	5−1, 7+5	9·1
23	3474	,,	,,	4+1, 6+7	8·3
Mar					
2	3481	,,	,,	2−5, 3+4	7·4
5	3484	,,	,,	3+5, 4+10	7·4
7	3486	32	Ca	2 (4) v (6) 3	7·2
13	3492	45	Bh	2−1	6·9
17	3496	,,	,,	=2	6·8
18	3497	32	Ca	=2	6·8
19	3498	31	D	2 (1) v (3) g, 2−3	7·1
21	3500	45	Bh	2−1	6·9
24	3503	32	Ca	2 (2) v (8) 3	7·0
24	3503	34	Li	1 (9) v (1) 2	6·7
25	3504	45	Bh	=2	6·8
26	3505	31	D	2 (1) v (3) g, 2−3	7·1
26	3505	50	Bn	2−5, e+1, 3+5	7·3
27	3506	45	Bh	=2	6·8
Apr					
1	3511	,,	,,	=2	6·8
4	3514	32	Ca	e (1) v (4) 3	7·4
6	3516	F	Wf	2−3, e+1	7·2
7	3517	30	Bn	2 (3) v (1) e	7·2
8	3518	34	Li	1 (9) v (1) 2	6·7
8	3518	45	Bh	2−1	6·9
13	3523	,,	,,	=2	6·8
14	3524	30	Bn	2 (3) v (1) e	7·2
14	3524	34	Li	1 (9) v (1) 2	6·7
14	3524	44	Wi	=2	6·8*b*
15	3525	F	Wf	2−4, =e	7·3
16	3526	30	Sm	=2	6·8
16	3526	32	Ca	e (3) v (2) 3	7·6
17	3527	45	Bh	2−2	7·0

Feb. 26, Yellow.
Mar. 19, Wf, Red.
Mar. 26, Orange red.

Oct. 14, Not seen.
Mar. 2, Orange-yellow.
Mar. 13, Yellow.

(4847) S VIRGINIS—*continued.*

1923					
Apr					
19	3529	30	D	2 (4) v (1) g, g+3	7·7
22	3532	32	Ca	e (2) v (3) 3	7·5
23	3533	30	D	2 (3) v (1) g, g+3	7·6
24	3534	,,	Bn	e (2) v (1) f	7·6
27	3537	,,	D	2 (3) v (1) g, g+4	7·6
27	3537	45	Bh	2−5, 3+5	7·3
May					
1	3541	,,	,,	2−7, 3+3	7·5
2	3542	30	Sm	4+6	7·8
3	3543	32	Ca	=3	7·8
3	3543	90	Bh	3+3	7·5
4	3544	30	Bn	f (1) v (1) 3	7·8
4	3544	44	Wi	3+1	7·7
5	3545	,,	,,	=3	7·8
5	3545	30	D	g−1, 4+4	8·0
6	3546	F	Wf	4+5	7·9
8	3548	90	Bh	3−2, 4+4	8·0
9	3549	32	Ca	e (4) v (1) 3	7·7
10	3550	30	D	g−2, 4+3	8·1
12	3552	,,	Sm	4+3	8·1
12	3552	34	Li	2 (8) v (2) 3	7·6
13	3553	90	Bh	3−6, 4+2	8·3
13	3553	30	D	g−3, 4+2	8·2
16	3556	34	Li	2 (8) v (2) 3	7·6
17	3557	30	Bn	3 (1) v (3) 4	8·0
17	3557	45	Bh	3−7, 4+3	8·3*b*
20	3560	F	Wf	4+2	8·2
30	3570	90	Bh	=4	8·4
June					
2	3573	,,	,,	4−3, 6+3	8·7
3	3574	F	Wf	3−6, =4	8·4
6	3577	50	Gr	4−3, 5+3	8·7
11	3582	,,	Bn	5 (1) v (3) 7	9·1
11	3582	90	Bh	=5, =6	9·0
11	3582	40	Ry	6+0·5	9·0
14	3585	62	Wf	4−3, 6+3	8·7
17	3588	30	Sm	=6	9·0
23	3594	90	Bh	5−2, 6−2	9·2*b*
24	3595	30	Sm	6 (2) v (3) 7	9·2*b*
July					
1	3602	45	Bh	5−5, 6−5	9·5*b*
1	3602	32	Ca	6 (2) v (2) 8	9·2
1	3602	157	Wf	6−4, 7+1	9·4
2	3603	30	Sm	7 (2) v (4) 6	9·4
4	3605	50	Gr	=7	9·6
6	3607	40	Ry	6−4	9·4
7	3608	50	Gr	7−2	9·8
8	3609	30	Sm	=7	9·6
12	3613	32	Ca	8 (2) v (5) 9	9·6
15	3616	30	Sm	=7	9·6
30	3631	50	Ry	8−4, 12−1	10·2*b*
Aug					
1	3633	30	Sm	14 (2) v (3) 12	10·2
3	3635	80	Ry	11−2, 12−1	10·6*b*
8	3640	,,	,,	11−3, 12+1	10·6*b*
10	3642	32	Ca	<12	<10·5
11	3643	30	Sm	=16	10·7*b*
29	3661	80	Ry	<4	< 8·4
Sept					
5	3668	30	Sm	<16	<10·7
Oct					
25	3718	90	Bh	<16	<10·7

April 10, 5*c*.
July 30, t.
Aug. 10, Glimpsed.
Aug. 29, Sept. 5, Oct. 25, Not seen.

1923					
Nov					
3	3727	90	Bh	<24	<12·1
7	3731	,,	,,	<22	<12·0
12	3736	170	Ry	<12	<10·5
19	3743	90	Bh	19−5	12·0
Dec					
4	3758	,,	,,	16−10, 19−2	11·7
11	3765	80	Ry	18−1, 19+0·5	11·4
15	3769	,,	Ca	18 (3) v (4) 23	11·6
16	3770	50	Ry	18+1·5, =19	11·3
16	3770	90	Bh	16−4, 19+4	11·1
24	3778	,,	,,	8−12, 7−12, 12−4	10·8
24	3778	80	Ry	16−4, 18+2	11·1
24	3778	120	Bn	19+1	11·4
1924					
Jan					
3	3788	90	Bh	8−10, 7−10, 12−1	10·5
5	3790	,,	,,	14 (1) v (1) 18, 12−2	10·7
6	3791	50	Bn	16 (2) v (1) 18	11·1
11	3796	90	Bh	14−4, 12−1	10·5
14	3799	50	Bn	16 (1) v (1) 18	11·0
15	3800	60	D	12−5	11·0
16	3801	90	Bh	=12	10·5
23	3808	,,	,,	8−8, 12+3	10·2
25	3810	,,	,,	8−5, 7−3	9·9
27	3812	,,	,,	8 (1) v (1) 12	9·9
31	3816	,,	,,	8 (1) v (1) 7	9·5
Feb					
1	3817	50	Bn	=11	10·3
1	3817	60	D	12−1	10·0
5	3821	32	Ca	=14	10·0
8	3824	60	D	12+1	10·4
8	3824	62	Wf	7−6, 12+3	10·2
11	3827	90	Bh	4−1	8·5
12	3828	32	Ca	7 (1) v (3) 14	9·7
14	3830	30	D	8−4, 14+3	9·7
14	3830	50	Bn	8 (3) v (2) 10	9·8
14	3830	90	Bh	3−5, 4+1	8·3
22	3838	,,	,,	3 (1) v (1) 4	8·1
24	3840	45	,,	3 (2) v (1) 4	8·2
25	3841	32	Ca	=7	9·6
26	3842	90	Bh	3 (1) v (1) 4	8·1
28	3844	,,	,,	3 (3) v (1) 4	8·3
28	3844	30	D	4−6, 6+1	9·0
29	3845	32	Ca	=0	9·0
Mar					
2	3847	90	Bh	5+4, 6+4, 8+8	8·6
2	3847	30	Sm	4 (1) v (1) 6	8·7
4	3849	,,	D	4−4, 6+2	8·8
4	3849	50	Bn	4 (5) v (1) 5	8·9
6	3851	32	Ca	4 (3) v (3) 6	8·7
7	3852	45	Bh	=4	8·4
8	3853	30	D	4−3, 0+4	8·7
8	3853	50	Bn	3 (3) v (1) 4	8·3
8	3853	30	Sm	=4	8·4
10	3855	32	Ca	8 (3) v (2) 4	8·2
10	3855	60	D	4−1, 6+5	8·5
11	3856	45	Bh	3+1	7·7
12	3857	30	Bn	f−2, 3−1	7·9
13	3858	,,	Sm	4+5	7·9
14	3859	45	Bh	3+2	7·6
19	3861	30	D	8+1	7·8
18	3863	32	Ca	e (4) v (2) g	7·7
19	3864	45	Bh	2 (3) v (1) 3	7·6

Nov. 3, 7, 12, Not seen.
Dec. 16, Ry, t.
Dec. 24, Ry, Difficult.

(4847) S VIRGINIS—*continued.*

1924					
Mar					
22	3867	45	Bh	2 (1) v (1) 3	7·3*b*
25	3870	30	Sm	2−4	7·2*b*
25	3870	32	Ca	e (2) v (2) f	7·5
26	3871	45	Bh	2 (1) v (3) 3	7·0
29	3874	,,	,,	2+1	6·7
29	3874	30	Bn	e (2) v (1) f	7·6
30	3875	,,	D	2 (3) v (2) g, g+5	7·5
30	3875	,,	Sm	2 (2) v (3) 3	7·2
31	3876	10	Wi	2−3	7·1
31	3876	32	Ca	e (1) v (3) f	7·4
Apr					
1	3877	25	Bn	e+1	7·2
1	3877	10	Wi	2−1, e+3	7·0
2	3878	45	Bh	=2	6·8
4	3880	25	Bn	2 (3) v (1) e	7·2
5	3881	32	Ca	2 (2) v (3) e	7·0
5	3881	30	Sm	2 (1) v (4) 3	7·0
6	3882	45	Bh	2−1	6·9
7	3883	30	D	2 (1) v (2) g, 2−4	7·2*b*
7	3883	10	Wi	2−2	7·0
7	3883	25	Bn	2−1, e+4	6·9
8	3884	60	Kw	2 (1) v (2) 4, 2−5	7·3
9	3885	25	Bn	e+3	7·0
9	3885	32	Ca	2 (2) v (3) e	7·0
9	3885	10	Wi	=2	6·8
10	3886	30	D	=e	7·3*b*
10	3886	,,	Sm	=2	6·8
11	3887	45	Bh	=2	6·8
14	3890	,,	,,	2+1	6·7
14	3890	32	Ca	2 (2) v (3) e	7·0
20	3896	25	Bn	2−4·5, e+1	7·2
20	3896	45	Bh	2+1	6·7
23	3899	F	Wf	2−2, 3+7	7·1
23	3899	32	Ca	2 (2) v (3) e	7·0
23	3899	30	Sm	2 (2) v (3) 3	7·2
25	3901	45	Bh	2+1	6·7
27	3903	60	Kw	2 (1) v (2) 4, 2−5	7·3
27	3903	10	Wi	2−3, e+2	7·1
28	3904	30	Sm	2−4, 3+6	7·2
30	3906	45	Bh	=2	6·8
May					
1	3907	30	D	e (3) v (4) f	7·5*b*
1	3907	25	Bn	e (3) v (1) f	7·6
1	3907	10	Wi	2−1·5	6·9
3	3909	30	Sm	2 (1) v (1) 3	7·3
3	3909	45	Bh	2 (2) v (3) 3	7·2
4	3910	32	Ca	=e	7·3
4	3910	30	D	=f	7·7
5	3911	45	Bh	2 (1) v (1) 3	7·3
5	3911	10	Wi	2−5, 3+5	7·3
5	3911	F	Wf	2−6, 3+4	7·4
5	3911	25	Bn	3+2	7·6
7	3913	30	D	f−1	7·8
9	3915	,,	Sm	2 (7) v (3) 3	7·5
10	3916	45	Bh	2 (3) v (1) 3	7·6
11	3917	32	Ca	e (2) v (3) 3	7·5
11	3917	62	Wf	2−4, 3+5	7·3
13	3919	30	D	f−2, 4+5	7·9
13	3919	90	Bh	4 (1) v (2) 5, 4 (1) v (2) 6	8·6
18	3924	,,	,,	3 (1) v (1) 4	8·1
19	3925	50	Bn	f (1) v (1) 3	7·8
21	3927	30	Sm	=3	7·8
1924					
May					
22	3928	90	Bh	=3	7·8
23	3929	62	Wf	3−3, 4+6	8·0
25	3931	30	D	g−3, 4+2	8·2
25	3931	t	Bk	3 (2) v (2) 4	8·1*b*
26	3932	,,	,,	=4	8·4*b*
26	3932	90	Bh	3 (1) v (1) 4	8·1
27	3933	45	,,	3+1, 4+5	7·8
27	3933	32	Ca	g (1) v (4) 4	8·0
27	3933	50	Bn	3+1	7·7
28	3934	30	Sm	3 (2) v (4) 4	8·0
29	3935	,,	D	g−4, 4+1	8·3
29	3935	65	Gl	2−14, 3−3, 4+2·5	8·2
31	3937	45	Bh	3 (2) v (1) 4	8·2
June					
1	3938	62	Wf	3−3, 4+2	8·2
1	3938	30	D	=4	8·4
2	3939	t	Bk	3−4, 4+2	8·2*b*
3	3940	32	Ca	g (2) v (3) 4	8·1
8	3945	,,	,,	3 (5) v (1) 4	8·3
8	3945	t	Bk	=3	7·8*b*
13	3950	45	Bh	3−1	7·9
17	3954	,,	,,	3 (2) v (1) 4	8·2
18	3955	30	Sm	4 (3) v (3) 6	8·7
19	3956	45	Bh	4 (1) v (2) 5	8·6
22	3959	60	D	4−5, 6+1	8·9
24	3961	62	Wf	4−6, 6+1	9·0
24	3961	t	Bk	=6	9·0*b*
25	3962	30	Sm	=6	9·0
27	3964	65	Gl	4−8, 7+4	9·2
27	3964	62	Wf	6+1, 8+5	8·9
30	3967	45	Bh	=4, =5, =6	8·8*b*
July					
2	3969	,,	,,	3 (2) v (1) 6, 4 (2) v (1) 5, 4 (2) v (1) 6	8·7*b*
2	3969	T	Bk	7+5	9·1*b*
2	3969	30	Sm	6 (2) v (4) 7	9·2
4	3971	45	Bh	4 (1) v (2) 5, 4 (1) v (2) 6	8·6*b*
4	3971	62	Wf	=6	9·0
9	3976	T	Bk	7−2	9·8*b*
12	3979	50	Sm	=7	9·6*b*
21	3988	32	Ca	8 (1) v (1) 7	9·5
Aug					
3	4001	,,	,,	11 (1) v (1) 12	10·4
4	4002	30	Sm	=14	10·0
7	4005	65	Gl	8−7, 12+4	10·1*b*
19	4017	30	Sm	=12, 16+2	10·5
21	4019	65	Gl	12−1, 16+1	10·6*c*
26	4024	30	Sm	=15	11·1*b*
29	4027	65	Gl	12−11, 23+4	11·6*c*
Sept					
3	4032	50	Sm	<15	<11·1*b*
Nov					
16	4106	90	Bh	<19	<11·5
29	4119	32	Ca	<15	<11·1
Dec					
1	4121	90	Bh	23−1, =25	12·2*b*
4	4124	,,	,,	23−1	12·1

April 7, D, 5[c].
April 8, T.
May 1, D, Difficult.

May 22, 27, Bh, Orange.
June 13, Orange-red.
June 30, Unsteady.
Aug. 21, Unsteady. Difficult.
Aug. 29, Very difficult.
Sept. 3, Not seen.
Nov. 29, Invisible.

(4847) S VIRGINIS—*continued.*

1924 Dec					
8	4128	60	D	<19	11·5*b*
13	4133	90	Bh	19−5	12·0
19	4139	,,	,,	19−4	11·9
23	4143	32	Ca	<19	<11·5
24	4144	120	Bn	23+2·5	11·8

Dec. 8, 23, Invisible.

1924 Dec					
24	4144	90	Bh	19−2	11
28	4148	,,	,,	16 (1) v (1) 29, 16−8, =19, 23+4, 29+8	11
28	4148	120	Bn	19−3, 23+2	11
30	4150	60	D	19−4, 23+2	11
31	4151	90	Bh	18 (1) v (1) 19	11

(7560) R VULPECULÆ. (V. 1.)

H.D. 205923.

Star P = B.D. + 23° 4243, $8^{m}\cdot4$, estimated.

The variability of Hagen's 6 was discovered in 1925 by W. F. H. Waterfield, then Member of the Section, and confirmed from an examination of 68 plates of the Harvard Collection by Miss Woods (H.B. 820, 1925). It has received the designation of VZ Vulpeculae (A.N. 5435, 1926).

The following faint stars near the Variable were used on a few occasions :—

Letter	$\Delta\alpha$	$\Delta\delta$	Mag.
B	$-10^{s}\cdot4$	+3′·37	12·35
C	−6·0	−1·99	12·92
D	+12·8	+1·99	13·22

The positions are from a Yerkes photograph of the Rumford Region [Mem. of the Ac. of Arts and Sciences, Vol. xiv., No. 4 (1923), plate vi.]. The magnitudes, which must be considered as provisional, are the means of estimates by de Roy, Phillips, Steavenson and Waterfield, made with large instruments on the sequence of **H.A., 37,** 177, in which the faintest stars appear to be over-estimated.

Date.	Julian Date.	Inst.	Observer.	Comparisons.	Deduced Mag.
1920 Jan					
1	2325	90	Bh	5+3, 6+6	8·4
8	2332	,,	,,	2−10, 3−8, 5+4, 4+5	8·2
9	2333	22	Bl	P (1) v (3) 4, =P	8·5
13	2337	90	Bh	3−8, 5+4	8·2
15	2339	,,	,,	3−6, 5+6	8·0
15	2339	45	Br	3−1	7·5
19	2343	30	Bn	3 (3) v (1) e	7·9
19	2343	48	Bg	3−4, 5+7·5	7·8
21	2345	,,	,,	3−3, 5+8·5	7·7
21	2345	22	Bl	3 (1·5) v (6) P	7·6
23	2347	90	Bh	2−5, 3−3, 5+9	7·7
24	2348	22	Bl	3 (1) v (6) P	7·6
27	2351	90	Bh	2−5, 3−3	7·7
31	2355	,,	,,	3−7, 5+5	8·1*b*
Feb					
4	2359	,,	,,	3−6, 5+6	8·0
7	2362	55	Bg	3−4·5, 5+7	7·9*b*
10	2365	90	Bh	3−9, 5+3	8·3
15	2370	,,	,,	5+2	8·4
23	2378	,,	,,	5−8, 19+5	9·3
24	2379	94	Bl	7 (3) v (3) 11	9·4
29	2384	90	Bh	19−3, 25+4	10·0

Date.	Julian Date.	Inst.	Observer.	Comparisons.	Deduced Mag.
1920 Mar					
4	2388	90	Bh	19−5, =25	10·3
7	2391	,,	,,	19−8, 25−2, 31+3	10·6
12	2396	,,	,,	25−5, =31, 40+3	10·9
16	2400	,,	,,	=37, =40	11·3
18	2402	,,	,,	=57, =59	11·6
18	2402	94	Bl	57−0·5	11·6
25	2409	90	Bh	59−3, =66	12·3
31	2415	,,	,,	71−2, 79+2	12·7
Apr					
9	2424	,,	,,	<66	<12·3
11	2426	,,	,,	59−8, 66−5, 75−1	12·8
16	2431	94	Bl	71 (2) v (1) 79	12·3
17	2432	90	Bh	57−5, 59−4, =66	12·3
21	2436	,,	,,	40−5, 43−5, =57, =59	11·6
22	2437	94	Bl	=38	11·2
27	2442	90	Bh	=37, =40	11·3
May					
2	2447	55	Bg	=24, =25	10·3
4	2449	94	Bl	11 (3) v (2) 19	9·3
4	2449	90	Bh	=25, 31+3	10·3

April 9, Not seen.

(7560) R VULPECULÆ—*continued.*

1920 May					
7	2452	90	Bh	6−10, 19−3	10·1
9	2454	,,	,,	9−2, =11, 19+2	9·6
10	2455	60	D	11−2, 19+2	9·7
10	2455	94	Bl	7 (4) v (2) 11	9·5
12	2457	90	Bh	19+5	9·3*b*
14	2459	,,	,,	=6	9·1
14	2459	45	Br	5−4, 9+4	9·0
14	2459	94	Bl	7 (3) v (3) 11	9·4
17	2462	90	Bh	6+2, 9+5	8·9
21	2466	,,	,,	19+10	8·8*b*
23	2468	,,	,,	5−1	8·7
23	2468	45	Br	4−1, 7+4	8·9
28	2473	22	Bl	P (1·5) v (3·5) 4	8·5
29	2474	90	Bh	3−4, 5+8	7·8
June					
2	2478	45	,,	3−5, 5+7	7·9
3	2479	50	Bn	e (3) v (1) f	8·4
4	2480	90	Bh	3−5	7·9
8	2484	,,	,,	3−6	8·0
8	2484	22	Bl	P+3	8·1
9	2485	45	Br	3−5	7·9
9	2485	30	D	3 (3) v (1) 5, 5+3	8·3
15	2491	,,	,,	3 (3) v (2) 5, 5+5	8·1
15	2491	45	Bh	3−5	7·9*b*
17	2493	22	Bl	3 (5) v (1) P, =P	8·3
18	2494	45	Bh	2−5, 3−2	7·7
19	2495	,,	Br	3−8, 4+5·5	8·2
19	2495	30	D	3 (4) v (1) 5, 5+4	8·3
22	2498	,,	,,	3 (4) v (1) 5, 5+3	8·3
23	2499	55	Bg	3−8, 5+3	8·3
23	2499	45	Bh	3−5	7·9*b*
29	2505	90	,,	5−2, 6+3	8·8*b*
30	2506	30	D	5+1·5	8·4*b*
30	2506	22	Bl	P (4) v (1) 4	8·7
July					
3	2509	55	Bg	5−2, 6+2	8·8
7	2513	90	Bh	19+5	9·3
8	2514	55	Bg	6−2, 11+3	9·3
8	2514	30	D	5−6, 9+2	9·2
10	2516	90	Bh	19+3	9·5
12	2518	30	D	5−6, 9+2	9·2
13	2519	55	Bg	11−1·5, 19+1	9·7
14	2520	94	Bl	7 (3·5) v (1·5) 11	9·5
14	2520	43	Gi	11−2, 19+4	9·6*b*
15	2521	90	Bh	=19	9·8
15	2521	120	Bn	19+1	9·7
18	2524	160	Br	19+2	9·6
19	2525	90	Bh	19−3, 21+2	10·1
19	2525	120	Bn	29 (1) v (1) 40	11·0
20	2526	60	D	=27	10·5*b*
24	2530	94	Bl	=38	11·2
24	2530	43	Gi	27−3, 38+3	10·9*b*
27	2533	90	Bh	19−8, 25−2	10·6*b*
30	2536	,,	,,	=40	11·4
30	2536	75	Gi	40+1·5	11·2*b*
Aug					
6	2543	120	Br	63−1, 66+1	12·2
7	2544	75	Gi	57−2·5, =59	11·8*b*
10	2547	183	Ma	57−5	12·3*b*
12	2549	94	Bl	79−3	13·2
13	2550	150	Bh	66−8, 75−1, 78−1	12·9
15	2552	75	Bg	=78	12·8
18	2555	150	Bh	66−5, =78, =79	12·8

July 20, About. Not sure.
Aug. 10, Very difficult.
Aug. 15, About.

1920 Aug					
20	2557	90	Bh	66−5, 75−2, =78	12·8
23	2560	94	Bl	79−6	13·5
26	2563	90	Bh	<66	<12·3
Sept					
1	2569	,,	,,	59−2, 66+1	12·2
5	2573	,,	,,	=57, =59	11·9*b*
8	2576	,,	,,	=45	11·5
9	2577	117	Gi	=40	11·4
10	2578	79	Ma	40 (1) v (1) 57	11·6
10	2578	...	Gr	=57	11·8
11	2579	160	Br	=57	11·8
12	2580	120	Bn	29 (5) v (1) 40	11·2
12	2580	...	Gr	=57	11·8
13	2581	90	Bh	35−2, 40+2	11·2
15	2583	...	Gr	=40, =45	11·4
16	2584	94	Bl	19 (5) v (1) 29, =29	10·5
16	2584	90	Bh	=31, =35	10·9
18	2586	...	Gr	=31	10·9
18	2586	90	Bh	=31, =35	10·9
19	2587	55	Bg	25−1, 31+4	10·5
19	2587	120	Bn	29 (4) v (1) 40	11·2
21	2589	...	Gr	=25	10·3*b*
22	2590	90	Bh	=31	10·9
25	2593	...	Gr	19−1	9·9
26	2594	160	Br	19−1	9·9
26	2594	90	Bh	19+1	9·7
27	2595	...	Gr	=19	9·8
28	2596	...	,,	19+1	9·7
28	2596	94	Bl	7 (5) v (1) 11, =11	9·5
28	2596	75	Gi	11−3, 19+2	9·7
29	2597	,,	Bg	19−1, 25+4	9·9*b*
30	2598	...	Gr	19+2	9·6
Oct					
1	2599	45	Bh	19+4	9·4
6	2604	,,	,,	5−5, =6	9·1
6	2604	...	Gr	=9	9·4
7	2605	94	Bl	4 (5) v (1) 7	9·2
8	2606	...	Gr	5 (1) v (1) 9	9·0
9	2607	90	Bh	=5, 6+5	8·6
11	2609	55	Bg	6−3, 11+2	9·4*b*
12	2610	90	Bh	5−1	8·7
12	2610	...	Gr	5 -2	8·8
13	2611	75	Bn	6+1	9·0
13	2611	,,	Gi	=5	8·6
14	2612	22	Bl	4 (1) v (4) 7, =4	8·8
15	2613	...	Gr	5−1	8·7
17	2615	90	Bh	5+1, 6+5	8·5
18	2616	30	D	5+1·5	8·4
19	2617	55	Bg	5−2, 6+2·5	8·8
20	2618	50	Bn	4 (1) v (2) 6	8·9
21	2619	...	Gr	5−1	8·7
22	2620	45	Bh	5+3, 6+7	8·3*b*
23	2621	...	Gr	4+1	8·7
24	2622	90	Bh	3−8, 5+4, 6+8	8·2
25	2623	22	Bl	=4	8·8
25	2623	...	Gr	=5	8·6
26	2624	55	Bg	3−10, 5+1·5	8·4
28	2626	...	Gr	5+2	8·4
29	2627	22	Bl	P (3·5) v (1·5) 4	8·7
29	2627	45	Bh	2−12, 5+3, 6+6	8·4*b*
30	2628	90	,,	5+5	8·1
30	2628	55	Bg	5−1, 6+4	8·7

Aug. 26, Not seen. 66 glimpsed.
Sept. 12, Bn, t.
Sept. 26, Br, Reddish.
Oct. 7, With 22, 9·3.

(7560) R VULPECULÆ—*continued.*

1920 Oct 30	2628	45	Br	4+2	8·6
Nov 1	2630	183	Ma	3−5	7·9*b*
1	2630	30	D	5+1	8·5*b*
1	2630	50	Bn	=4	8·8
1	2630	90	Bh	3−8, 5+4	8·2
3	2632	45	,,	3−8, 5+5	8·2
5	2634	47	Gi	4−1·5, 5+3	8·6
5	2634	...	Gr	=5	8·6
7	2636	...	,,	=5	8·6
8	2637	22	Bl	=4	8·8
9	2638	...	Gr	5−1	8·7
10	2639	90	Bh	3−9, 5+4	8·3
11	2640	50	Ma	5−1	8·7
11	2640	,,	Bn	4 (1) v (1) 6	8·9
12	2641	...	Gr	5−3	8·9
12	2641	55	Bg	=5, 6+5	8·6*b*
13	2642	45	Bh	3 (1) v (1) 6, 5+2	8·3
14	2643	...	Gr	5−3	8·9
16	2645	...	,,	5−3	8·9
16	2645	55	Bg	5−3, 6+2	8·9
16	2645	90	Bh	5+2	8·4
17	2646	22	Bl	4 (3) v (2) 7	9·1
18	2647	45	Br	=5, =4	8·7
18	2647	47	Gi	4−4·5, 7+3	9·1
18	2647	...	Gr	5−4, 9+4	9·0
19	2648	55	Bg	5−4, 6+1	9·0
19	2648	90	Bh	5−1, 6+4	8·7
21	2650	...	Gr	9+3	9·1
24	2653	90	Bh	5 (1) v (2) 6	8·7*b*
25	2654	...	Gr	=9	9·4*c*
30	2659	45	Bh	5 (1) v (1) 6	8·8*b*
Dec 1	2660	75	Bg	19−1, 25+4	9·9
2	2661	94	Bl	11 (5) v (1) 19	9·7
2	2661	,,	Gr	=25	10·3
7	2666	117	Gi	=31	10·9*b*
8	2667	90	Bh	19−5, =25, 31+5	10·3
8	2667	94	Gr	=25	10·3
10	2669	183	Ma	=31, 40+1·5	11·0
10	2669	90	Bh	19−10, 25−5, =31	10·8
12	2671	,,	,,	31−3, 40+2, 43+3	11·2
12	2671	94	Gr	=40	11·4
17	2676	,,	,,	=40	11·4
17	2676	90	Bh	40−2, 43−1	11·6*b*
21	2680	,,	,,	40−2, 49+1	11·5
26	2685	,,	,,	49−1, 59+2	11·8
28	2687	120	Bn	57−2	12·0*b*
31	2690	90	Bh	=57, =59	11·9*b*
1921 Jan 4	2694	117	Gi	=59	12·0*b*
6	2696	90	Bh	59−3	12·3
14	2704	,,	,,	=59	12·0
14	2704	94	Bl	79−5	13·4
15	2705	120	Br	57−1, 63+1	12·0*b*
20	2710	117	Gi	57−1	11·9*c*
21	2711	90	Bh	<49	<11·6
27	2717	45	,,	25−5, 31−1	10·9*b*
Feb 2	2723	90	,,	19−2·5, 25+1	10·1
3	2724	45	,,	19+1	9·7*b*
1921 Feb 9	2730	90	Bh	19+1	9
17	2738	,,	,,	5−6, =6	9
18	2739	47	Gi	5−1·5, 7+4	8
21	2742	90	Bh	5−1, 6+4	8
Mar 2	2751	,,	,,	3−2, 5+10	7
2	2751	22	Bl	3 (1) v (5) P	7
4	2753	47	Gi	3−1, d+1	7
5	2754	45	Bh	2−1, =3	7
9	2758	22	Bl	2 (1) v (1) 3	7
11	2760	45	Bh	=2, =3	7
24	2773	,,	,,	2−3, 3−1	7
24	2773	22	Bl	=3	7
Apr 1	2781	45	Bh	3−5	7
3	2783	47	Gi	3−12, 4+3·5	8
4	2784	22	Bl	=4	8
4	2784	90	Bh	=5	8
8	2788	,,	,,	3−8, 5+4	8
9	2789	,,	,,	5−2	8
11	2791	22	Bl	4 (4·5) v (1·5) 7	9
15	2795	90	Bh	5−5, =6	9
19	2799	,,	,,	25+2, 31+6	10
19	2799	94	Bl	7 (4) v (1) 11, =11	9
22	2802	117	Gi	11−5, 19+2	9
25	2805	90	Bh	=31	10
26	2806	94	Bl	=19	9
29	2809	90	Bh	31−2	11
May 3	2813	94	Bl	29 (4) v (1) 38	11
6	2816	117	Gi	40−2, 57+2	11
7	2817	90	Bh	=49	11
9	2819	,,	,,	49−1	11
12	2822	94	Bl	71 (2) v (1) 79	12
23	2833	90	Bh	<59	<12
31	2841	,,	,,	75−3, 79−1	13
31	2841	94	Bl	79−5	13
June 2	2843	90	Bh	57−10, 59−10	12
4	2845	117	Gi	70−6	13
4	2845	94	Gr	=57	11
7	2848	120	Br	63−2	12
10	2851	90	Bh	43−2, =49	11
11	2852	94	Bl	79−3	13
12	2853	,,	Gr	<57	<11
15	2856	90	Bh	43+1, 49+3	11
16	2857	117	Gi	40−3·5, 57+2	11
16	2857	94	Bl	38 (4) v (2) 57	11
21	2862	90	Bh	=31	10
23	2864	75	Bg	=31	10
23	2864	94	Gr	31−2	11
24	2865	,,	,,	=31	10
24	2865	,,	Bl	19 (6) v (1) 29	10
24	2865	90	Bh	25−3, 31+2	10
27	2868	,,	,,	25−1, 31+4	10
27	2868	60	D	25−2	10
28	2869	50	Bn	20 (3) v (2) 25	10
28	2869	75	Gi	19−0·5	9
28	2869	94	Bl	19 (1) v (4) 29	10
28	2869	,,	Gr	19−2	10
30	2871	,,	,,	19−2	10

Dec. 2, Bl, With 22, 10·2.
Dec. 28, t, Just seen.
Jan. 14, Bl, Low.
Jan. 21, Not seen.
April 4, Bl, Uncertain. Bh, Unsteady.
May 23, Not seen.
June 7, Glimpsed. Difficult.
June 12, Uncertain.
June 27, D, Difficult.

(7560) R VULPECULÆ—*continued.*

1921					
June					
0	2871	55	Bg	25−1, 31+4	10·5*b*
July					
2	2873	90	Bh	13+1, 19+1	9·7
4	2875	45	,,	5−6, 19+6	9·2
4	2875	60	D	=11, 19+2	9·6*b*
4	2875	94	Gr	19+1	9·7*b*
4	2875	,,	Bl	=11	9·5
5	2876	55	Bg	19−1, 25+4	9·9
7	2878	160	Br	=11	9·5
7	2878	90	Bh	6+2, 9+5, 19+8	8·9
8	2879	120	Bn	11 (3) v (1) 19	9·7
8	2879	60	D	9+2, 19+4	9·3
8	2879	94	Bl	7 (1) v (4) 11	9·4
9	2880	,,	Gr	11+2	9·3
0	2881	55	Bg	9−1·5, 19+3	9·5
0	2881	75	Gi	5−5, 6+1·5	9·0
1	2882	60	D	5−5, 9+3	9·1
4	2885	94	Gr	5−3, 9+5	8·9
11	2892	55	Bg	5−1, 6+4	8·7
11	2892	50	Gr	=5	8·6
4	2895	,,	,,	=5	8·6
5	2896	,,	Bn	5 (2) v (1) 7	9·1
5	2896	30	D	5−0·5	8·6
6	2897	47	Gi	4−0·5, 5+1	8·7
6	2897	90	Bh	=5	8·6
8	2899	30	D	5−1, 7+6	8·7*b*
9	2900	90	Bh	5+2	8·4
9	2900	50	Gr	5+2	8·4
0	2901	30	D	=5	8·6
1	2902	22	Bl	4 (1) v (4) 7, =4	8·8
11	2902	55	Bg	3−10, 5+1·5	8·4
Aug.					
1	2903	30	D	5−2, 7+6	8·8
3	2905	,,	,,	=5	8·6*b*
4	2906	50	Gr	5+2	8·4
4	2906	90	Bh	2−4, 3−2	7·6
5	2907	75	Gi	4+1·5	8·6*b*
6	2908	55	Bg	3−10, 5+1·5	8·4
6	2908	90	Bh	2−10, 5+3	8·3
6	2908	30	D	5−2, 7+5	8·8
9	2911	,,	,,	5−3, 7+4	8·9*b*
9	2911	50	Gr	=5	8·6
14	2916	90	Bh	5−1	8·7
15	2917	75	Gi	5−1	8·7
18	2920	55	Bg	5−2, 6+3	8·8
21	2923	50	Gr	9+2	9·2
22	2924	45	Bh	5−5, 19+7	9·1*b*
23	2925	30	D	5−5, 7+2	9·1*b*
24	2926	94	Bl	4 (4·5) v (1·5) 7	9·2
25	2927	50	Gr	=11	9·5
25	2927	45	Bh	19+4	9·4
25	2927	55	Bg	6−1·5, 9+1·5	9·2*b*
26	2928	60	D	9−1, 11+2, 19+5	9·4
28	2930	75	Gi	6−2·5, 11+1	9·4
28	2930	60	D	=11, 19+2	9·6
30	2932	,,	,,	11−1, 19+2	9·6
30	2932	90	Bh	=25	10·3
31	2933	60	D	19+1	9·7
Sept.					
1	2934	50	Gr	=19	9·8
2	2935	60	D	19−0·5	9·8
3	2936	75	Bn	24−1	10·4*b*
4	2937	90	Bh	25−2, 31+3	10·6
5	2938	,,	,,	25−3, 31+2	10·7
5	2938	60	D	19−5, 29+3	10·3
5	2938	94	Bl	11 (4) v (1) 19, =19	9·8
6	2939	160	Br	=19	9·8
7	2940	117	Gi	19−3, 29+3	10·2*b*
7	2940	60	D	29−1	10·7
7	2940	85	Bn	=29	10·6
7	2940	55	Bg	25−3, 31+1·5	10·7
7	2940	79	Ma	=31	10·9
14	2947	94	Bl	38 (1) v (3) 57, =38	11·2
16	2949	90	Bh	=40, =43	11·4
21	2954	,,	,,	=57, =59	11·9
21	2954	94	Bl	57 (1) v (5) 79	12·0
21	2954	75	Bg	40−2, =49	11·6
24	2957	90	Bh	57−3, 59−2	12·2
24	2957	117	Gi	40−5, 57+1·5	11·8*b*
25	2958	120	Br	=71	12·5
25	2958	,,	D	57−3	12·1*b*
25	2958	,,	Bn	57 (2) v (1) 63	12·0
28	2961	75	Bg	49−2, 59+2	11·8
Oct.					
1	2964	94	Bl	=79	12·9
1	2964	90	Bh	<66	<12·3
1	2964	150	Bn	57 (4) v (1) 63	12·1
5	2968	120	,,	63+1	12·0
5	2968	75	Bg	59−3, 70+2	12·3
5	2968	90	Bh	75+2	12·5
5	2968	50	Gr	=63	12·1
6	2969	117	Gi	70−4	12·9*b*
8	2971	150	Bh	66−3, 75+1	12·6
9	2972	90	,,	66−5, 75−1	12·8
11	2974	94	Bl	57−5, =79	12·6*b*
15	2978	90	Bh	59−6, 66−4	12·6*b*
18	2981	50	Gr	=63	12·1
19	2982	75	Bg	=78	12·8*b*
23	2986	183	Ma	<57	<11·8*b*
23	2986	90	Bh	59−5, 66−2	12·5
27	2990	,,	,,	43−5, =59	12·0
27	2990	120	Br	52−1, 57+1	11·8
28	2991	79	Ma	57−2	12·0
30	2993	50	Gr	=57	11·8
31	2994	117	Gi	31−5, 40+2	11·3*b*
31	2994	90	Bh	=40, =43	11·4
Nov.					
2	2996	94	Bl	29 (4) v (2) 38	11·0
6	3000	55	Bg	19−4, 25+1	10·2
6	3000	160	Br	40+2	11·2
6	3000	90	Bh	25−3, 31+2	10·7
7	3001	,,	,,	=25	10·3
7	3001	79	Ma	=25	10·3
7	3001	120	Bn	19 (4) v (1) 25	10·2
10	3004	94	Bl	11 (3·5) v (1·5) 19	9·7
17	3011	96	Gr	=9	9·4
17	3011	117	Gi	7−0·5	9·4
22	3016	55	Bg	=6	9·1*b*
22	3016	90	Bh	5−3	8·9
24	3018	,,	,,	5−1	8·7
24	3018	22	Bl	4 (1) v (4) 7	8·9
26	3020	90	Bh	2−10, 5+3	8·3
29	3023	55	Bg	=5, 6+5	8·6
29	3023	90	Bh	5+5, 6+10	8·1
29	3023	47	Gi	e−2, f+1	8·3

July 8, Bl, With 22, 9·5.
Aug. 23, Difficult.

Sept. 7, Nov. 7, Ma, About.
Sept. 25, D, Difficult.
Oct. 5, 19, Bg, About.
Oct. 23, Ma, Not fairly seen.
Oct. 28, Steadily glimpsed.

(7560) R VULPECULÆ—*continued.*

1921					
Nov					
30	3024	96	Gr	5+3	8·3
Dec					
3	3027	45	Br	3−1	7·5
3	3027	90	Bh	2−9, 3−6, 5+6, 6+9	8·1
7	3031	55	Bg	3−6, 5+5·5	8·0*b*
12	3036	22	Bl	=3	7·4
13	3037	90	Bh	2−5, 3−3	7·7
15	3039	,,	,,	2−5, 5+8	7·8
19	3043	45	,,	3−5, 5+5	8·0
20	3044	55	Bg	3−6, 5+5·5	8·0
21	3045	96	Gr	3−6, 5+6	8·0
22	3046	30	Bn	e (1) v (2) f	8·2
23	3047	45	Bh	2−10, 3−8	8·2
25	3049	,,	Br	3−5, 5+6	8·0
25	3049	90	Bh	5+1, 6+6	8·5*b*
28	3052	,,	,,	5+2, 6+6	8·4
28	3052	55	Bg	3−8·5, 5+3	8·3
28	3052	30	Bn	f (3) v (1) 5	8·6
29	3053	90	Bh	5+4	8·2
30	3054	75	Gi	f−1·5, 4+3	8·5*b*
1922					
Jan					
1	3056	90	Bh	5+2, 6+5	8·5
2	3057	75	Bn	5 (1) v (3) 6	8·7
8	3063	90	Bh	=5	8·6
10	3065	,,	,,	5−2, 6+2	8·8
10	3065	94	Bl	4 (4) v (2) 7	9·2
11	3066	160	Br	9+1	9·3
16	3071	48	Bg	11−2, 19+1	9·7*b*
17	3072	75	Bn	11−2, =13, 19+1	9·7
18	3073	94	Bl	7 (5) v (1) 11	9·5
18	3073	90	Bh	19−3, 25+2	10·1
20	3075	,,	,,	19−5, =25, 31+5	10·3
21	3076	117	Gi	19−2, =25	10·2*b*
28	3083	90	Bh	31−2	11·1
Feb					
2	3088	,,	,,	40−4, =49	11·7
10	3096	,,	,,	59−2, =66	12·2*b*
25	3111	117	Gi	70−5	13·0*b*
Mar					
19	3133	90	Bh	=57, =59	11·9*b*
20	3134	94	Bl	38 (3) v (1) 57	11·7
28	3142	90	Bh	=19	9·8*b*
Apr					
4	3149	,,	,,	5−1, 6+3	8·7*b*
6	3151	94	Bl	=7	9·3*b*
14	3159	45	Bh	3−8, 5+4	8·2
19	3164	22	Bl	P (2) v (2) 4	8·6
29	3174	90	Bh	5+2	8·4
May					
2	3177	45	,,	3−9, 5+3	8·3
2	3177	22	Bl	P (2) v (1) 4	8·6
8	3183	47	Gi	f (2·5) v (2·5) 4	8·6
8	3183	45	Bh	3−10, 5+1, 6+6	8·5
10	3185	94	Bl	P (4) v (1) 4	8·7
17	3192	90	Bh	5−1, 6+5	8·6
19	3194	47	Gi	4 (1·5) v (4) 7	8·9
20	3195	94	Bl	4 (1·5) v (4·5) 7	8·9
27	3202	45	Br	5−2, 6+2	8·8

Dec. 29, Orange.
Feb. 25, Difficult.
Mar. 19, All three glimpsed.
April 6, Uncertain.
May 10, With 22, 8·8.
May 20, With 22, 9·1.

1922					
May					
27	3202	90	Bh	5−5, 6−1	
28	3203	62	D	9−1, 11+1, 19+4	
31	3206	45	Bh	5−10, 6−5	
June					
1	3207	117	Gi	11 (1) v (3) 19	
4	3210	45	Bh	19+2	
5	3211	94	Bl	11 (4·5) v (1·5) 19	
8	3214	45	Bh	19−5, =25	1
12	3218	90	,,	19−8, 25−2	1
14	3220	117	Gi	25 (5) v (1·5) 31	1
15	3221	94	Bl	29 (3·5) v (2·5) 38	1
15	3221	45	Bh	=31	1
22	3228	90	,,	=40, =43	1
22	3228	50	Gr	=40	1
24	3230	90	,,	=57	1
25	3231	94	Bl	38 (5) v (1) 57	1
26	3232	90	Bh	<43	<1
27	3233	,,	Gr	=63	1
28	3234	117	Gi	40 (3·5) v (3) 57	1
29	3235	94	Bl	57 (1) v (5) 79	1
July					
1	3237	90	Gr	=63	1
2	3238	,,	Bh	=57, =59	1
7	3243	94	Bl	79−2	1
10	3246	90	Bh	59−6, 66−3	1
16	3252	,,	Gr	63−5	1
18	3254	117	Gi	70−6	1
18	3254	120	Br	=79	1
20	3256	110	Bg	<59	<1
20	3256	120	Bn	63−3, 66−3	1
20	3256	90	Gr	=78	1
23	3259	157	Wf	Estimated	1
23	3259	90	Bh	<78	<1
25	3261	,,	Gr	=78	1
27	3263	,,	Bh	66−6, 78−2	1
29	3265	117	Gi	70−5	1
30	3266	231	Wf	Estimated	1
30	3266	90	Gr	=78	1
31	3267	55	Bg	=78	1
Aug					
5	3272	90	Bh	=57, =59	1
11	3278	,,	,,	=40, 43+1	1
12	3279	,,	,,	31−3, 40+1	1
12	3279	,,	Gr	=40	1
13	3280	117	Gi	25 (4·5) v (1·5) 31	1
15	3282	90	Gr	19−5	1
16	3283	75	Bg	19−4, 25+1	1
16	3283	150	Wf	19−4, =25	1
17	3284	90	Gr	=19	9
17	3284	,,	Bh	19−3	1
18	3285	,,	,,	19−2	1
19	3286	,,	,,	=19	9
20	3287	,,	,,	5−10, 19+2	9
20	3287	120	Br	19−3	1
20	3287	90	Gr	19+2	9
20	3287	55	Bg	=19	9
21	3288	62	Wf	=19	9
21	3288	90	Bh	19+3	9
23	3290	,,	,,	19+3	9

June 1, 5[c].
June 15, Bl, Uncertain.
June 26, Not seen.
July 7, 29, Difficult.
July 18, Br, About. Difficult.
July 23, Bh, Not seen.
July 31, About.

(7560) R VULPECULÆ—*continued.*

22					
1g					
3	3290	55	Bg	11−1·5, 19+1	9·7
4	3291	117	Gi	7 (2) v (1) 9	9·4
4	3291	90	Gr	19+5	9·3
5	3292	,,	Bh	5−4, 19+6	9·1
6	3293	62	Wf	=7	9·3
6	3293	55	Bg	11−0·5, 19+2	9·6
1	3298	,,	,,	=6	9·1
1	3298	90	Bh	=5	8·6
pt					
3	3301	150	Wf	4−1, 7+4	8·9
4	3302	45	Bh	3−5, 5+5	8·0
7	3305	90	,,	3−2, 5+8	7·7
8	3306	...	Gr	3−5, 5+5	8·0
9	3307	45	Bh	3−5, 5+5	8·0
0	3308	62	Wf	3 (5) v (5) 5	8·0
0	3308	22	Bl	=P	8·4
2	3310	45	Bh	3−5, 5+5	8·0*b*
3	3311	62	Wf	3−4, 5+7·5	7·8*b*
5	3313	90	Bh	3−8, 5+4	8·2
6	3314	62	Wf	3−6, 5+5	8·1
6	3314	...	Gr	3−2	7·6
8	3316	47	Gi	e (3·5) v (2) f	8·3
9	3317	62	Wf	3−4, 5+7	7·9
0	3318	55	Bg	3−10, 5+1	8·5
0	3318	...	Gr	3−5	7·9
1	3319	45	Bh	3−5, 5+5	8·0
2	3320	,,	Br	=4	8·8
3	3321	62	Wf	3−8, 5+2	8·3
3	3321	90	Bh	3−5, 5+5	8·0
4	3322	55	Bg	5−2, 6+3	8·8*b*
8	3326	22	Bl	P (4) v (1) 4	8·7
9	3327	...	Gr	5−2	8·8*b*
9	3327	55	Bg	5−2, 6+3	8·8
0	3328	90	Bh	3−8, 5+4	8·2
ct					
4	3332	,,	,,	=5	8·6*b*
5	3333	62	Wf	5−1, 6+5	8·6*b*
6	3334	22	Bl	4 (5) v (1) 7	9·2
6	3334	90	Bh	5−3, 6+3	8·8
11	3339	,,	,,	5−4, 6+2	8·9
11	3339	55	Bg	6−2, 11+3	9·3
12	3340	...	Gr	19−2	10·0
12	3340	117	Gi	7+1	9·2
13	3341	50	Bn	6 (2) v (1) 9	9·3
13	3341	90	Bh	6+1	9·0
14	3342	,,	,,	=6	9·1
14	3342	160	Br	=11	9·5
14	3342	94	Bl	4 (5) v (1) 7	9·2
14	3342	62	Wf	6−2, 11+2	9·3
16	3344	55	Bg	11−1, 19+1·5	9·6
18	3346	90	Bh	5−10, 6−5	9·6
21	3349	,,	,,	=19	9·8
22	3350	120	Bn	19+0·5	9·7
22	3350	62	D	19−1	9·9
25	3353	94	Bl	11 (4) v (1) 19	9·7*b*
25	3353	90	Bh	25−2, 31+3	10·6
28	3356	120	Bn	29 (1) v (3) 40	10·8
ov					
1	3360	55	Bg	25−2·5, 31+2·5	10·6
1	3360	...	Gr	=31	10·9*b*
1	3360	157	Wf	29−3, 35+3	10·8*b*
1	3360	90	Bh	=40, =43	11·4
4	3363	,,	,,	43−2, =49, 59+2	11·7*b*

Oct. 14, Bl, With 22, 9·3.
Oct. 22, D, Difficult.

1922 Nov					
5	3364	117	Gi	31 (2) v (3·5) 40	11·0*b*
6	3365	75	Pr	=40	11·4*b*
9	3368	90	Bh	=57	11·8
10	3369	...	Gr	=57	11·8
11	3370	120	Br	=57	11·8
11	3370	94	Bl	38 (3) v (1) 57, =57	11·7
11	3370	90	Bh	=59	12·0
15	3374	120	Bn	40 (3) v (1) 57	11·7
16	3375	...	Gr	=57	11·8
19	3378	150	Bh	57−10	12·8*b*
21	3380	117	Gi	=40, 57+2·5	11·5
24	3383	90	Bh	=57, =59	11·9*b*
Dec					
6	3395	,,	,,	40−1, =43	11·5
9	3398	117	Gi	40 (1·5) v (4) 57	11·5*b*
11	3400	90	Bh	40+1, 43+2	11·3
16	3405	,,	,,	=31	10·9
16	3405	55	Bg	25−3, 31+1·5	10·7*b*
17	3406	90	Bh	25−2, 31+2	10·6
23	3412	,,	,,	=19	9·8*b*
25	3414	,,	,,	19+3	9·5
26	3415	94	Bl	=7	9·3*b*
27	3416	75	Bn	9 (1) v (1) 11	9·4
28	3417	90	Bh	19+4	9·4*b*
1923 Jan					
3	3423	48	Bg	5−1·5, 6+3	8·8*b*
3	3423	75	Pr	3−6, 5+5	8·1*b*
4	3424	90	Bh	5+2	8·4
6	3426	,,	,,	5+3	8·3
8	3428	,,	,,	5+3	8·3
9	3429	30	Bn	5+2	8·4
9	3429	75	Pr	3−6, 5+5	8·1
10	3430	48	Bg	3−5, 5+6·5	7·9
11	3431	45	Bh	5+3	8·3
14	3434	,,	,,	3−7, 5+4	8·2
14	3434	30	Bn	e (1) v (1) f	8·3
15	3435	22	Bl	1 (5) v (3) P	8·0
16	3436	45	Bh	3−6, 5+6	8·0
18	3438	75	Pr	3−6	8·0*b*
18	3438	,,	Gi	=d, e+2·5	7·8
19	3439	45	Bh	3−4, 5+8	7·8
20	3440	,,	,,	2−3, 3−1	7·5
23	3443	62	Wf	2−4, 3+2	7·4
27	3447	90	Bh	2−3, 3−1	7·5
Feb					
3	3454	45	,,	=2, =3	7·3
7	3458	62	Wf	3−1	7·5
8	3459	45	Bh	3−4, 5+8	7·8
13	3464	22	Bl	P+2	8·2*b*
Mar					
13	3492	90	Bh	19−5	10·3*b*
24	3503	117	Gi	40 (1) v (3·5) 57	11·5*b*
26	3505	90	Bh	40−1, =43	11·5
Apr					
4	3514	94	Bl	=79	12·9*b*
9	3519	150	Wf	72−8	13·3*b*
13	3523	,,	Bh	<79	<12·9
15	3525	,,	,,	71−6, 79−3	13·1
15	3525	,,	Wf	72−8	13·3*b*
17	3527	90	Bh	75−5, 79−3	13·2

Dec. 26, With 22, 9·5.
Jan. 9, Pr, Ruddy.
Jan. 18, Gi, 6e.
April 4, Uncertain.
April 13, Not seen.

(7560) R VULPECULÆ—*continued.*

1923					
Apr					
20	3530	94	Bl	79−4	13·3
22	3532	90	Bh	57−10, 59−10	12·9
25	3535	117	Gi	70−5·5	13·0*b*
May					
3	3543	90	Bh	59−3, =66	12·3
10	3550	94	Bl	38 (3) v (3) 57	11·5
14	3554	60	D	31−2, 40+4	11·0
17	3557	90	Bh	31−2, 40+3	11·1
19	3559	117	Gi	29 (2·5) v (3) 31	10·7*b*
21	3561	62	Wf	25−5, =31	10·9
24	3564	94	Bl	=19	9·8
25	3565	60	D	19−4	10·2
30	3570	90	Bh	19−5	10·3*b*
June					
2	3573	,,	,,	19−2	10·0
5	3576	62	Wf	=11, 19+2	9·6
6	3577	94	Bl	7 (3·5) v (1·5) 11	9·5
6	3577	60	D	7−1, 9+1	9·3
8	3579	75	Gi	4 (6) v (1·5) 7	9·2
9	3580	62	Wf	=9, 19+5	9·3
10	3581	30	D	5−5, 7+2·5	9·1
11	3582	,,	,,	5−6, 7+2	9·2
11	3582	90	Bh	19+5	9·3
18	3589	22	Bl	4 (1·5) v (4·5) 7	8·9
21	3592	90	Bh	5−1, 6+5	8·6
22	3593	117	Gi	4−1	8·9
23	3594	90	Bh	5+1	8·5
26	3597	30	D	5−2, 7+5	8·8
28	3599	62	Wf	5−1, 6+3, 9+7	8·7
July					
1	2602	90	Bh	5+1	8·5
2	3603	96	Gr	6+2	8·9
3	3604	62	Wf	=5	8·6
4	3605	30	D	5−2, 7+5	8·8
4	3605	75	Pr	=5, 4+1	8·6*b*
5	3606	22	Bl	4 (5) v (1) 7	9·2
5	3606	90	Bh	5−3, 6+3	8·8
5	3606	55	Bg	5 (1) v (2) 6	8·7
6	3607	30	D	5−5, 7+2	9·1
6	3607	117	Gi	4 (2·5) v (5) 7	9·0
8	3609	50	Bn	6+1	9·0
8	3609	96	Gr	=4	8·8
10	3611	94	Bl	4 (4·5) v (2·5) 7	9·1
10	3611	62	Wf	5−4, 9+3	9·0
11	3612	55	Bg	5 (1) v (1) 6	8·8
13	3614	60	Ga	=9	9·4
14	3615	150	Wf	=9, 11+2	9·3
14	3615	45	Bh	5−5, =6	9·1*b*
16	3617	60	D	=9	9·4
19	3620	96	Gr	19+1	9·7
20	3621	55	Bg	19 (1) v (3) 25	9·9
20	3621	60	D	11−2, 19+1	9·7
20	3621	90	Bh	19+4	9·4
21	3622	120	Ga	19+2	9·6
21	3622	34	Li	8 (5) v (5) 19	9·5
29	3630	96	Gr	20−4, 31+3	10·6
30	3631	90	Bh	25−5, =31	10·9*b*
Aug					
2	3634	75	Bg	40 (1) v (4) 59, =45	11·5
3	3635	90	Bh	31−3, 40+2	11·2
3	3635	120	Ga	35−5, =40	11·4

June 6, Bl, With 22, 9·5.
June 22, o[c].
July 10, Bl, With 22, 9.2.
July 13, 21, Ga, t.
Aug. 3, Ga, T.

1923					
Aug					
5	3637	150	Wf	40−4, 51+1	11
5	3637	75	Bg	40 (1) v (3) 49	11
8	3640	120	Bn	57 (2) v (1) 63	12
8	3640	90	Bh	=40, =43	11
9	3641	,,	,,	40−3, =49	11
11	3643	75	Bg	49 (1) v (3) 59	11
12	3644	150	Wf	79−1	12
13	3645	120	Bn	66−1	12
15	3647	150	Wf	75−1	12
18	3650	90	Bh	59−3, 66−1	12
22	3654	110	Bg	<59	<12
28	3660	90	Bh	<70	<12
29	3661	157	Wf	79−3, C−1	13
31	3663	90	Bh	59−8, 66−5	12
Sept					
2	3665	150	,,	59−10	13
3	3666	157	Wf	79−7·5, C−3·5, =D	13
3	3666	94	Bl	79−5	13
5	3668	150	Bh	66−10, 79−2	13
7	3670	,,	,,	59−10, 66−7	13
7	3670	120	Br	66−3	12
8	3671	150	Bn	79−2	13
8	3671	157	Wf	C−3, D+1	13
8	3671	75	Bg	=78	12
11	3674	150	Bh	66−5	12
12	3675	157	Wf	79−4, C−1, D+2	13
13	3676	180	D	B−8, C−2, D+2	13
13	3676	120	Br	66−1	12
13	3676	110	Bg	<78	<12
13	3676	150	Bh	66−7, 70−3	12
15	3678	94	Bl	79−5	13
16	3679	90	Bh	57−8, 66−4, 69−6	12
22	3685	150	,,	57−2, 66+2	12
22	3685	157	Wf	57−2, 63+1	12
26	3689	90	Bh	57−2, 59−2	12
30	3693	,,	,,	=57, 59+1	11
30	3693	150	Wf	31−5, 40+1, 45+3	11
30	3693	75	Bg	40 (1) v (4) 49	11
30	3693	120	Br	40+1	11
30	3693	60	Ga	=35, 40+3	11
Oct					
1	3694	150	Wf	31 (3) v (2) 40	11
1	3694	90	Bh	57+2	11
4	3697	,,	,,	40+3, 43+4, 49+5	11
4	3697	120	Bn	29 (2) v (1) 40	11
7	3700	90	Bh	19−5, =25, 31+5	10
8	3701	62	Wf	19−3, 25+3	10
9	3702	60	Ga	25−2, =29	10
9	3702	90	Bh	19+1	9
11	3704	,,	,,	19+3	9
12	3705	,,	,,	19+4	9
12	3705	79	Ma	19−2, 25+2	10
13	3706	75	Pr	11−2, 19+2	9
13	3706	OG	Ph	=19	9
13	3706	96	Gr	19+2	9
14	3707	45	Br	=6	9
14	3707	55	Bg	=11	9
17	3710	90	Bh	19+7	9
19	3712	,,	,,	5−2	8
20	3713	,,	,,	5+3	8

Aug. 28, Not seen.
Sept. 8, Bg, About.
Sept. 13, D, 15-in. OG.
Sept. 30, Oct. 9, Ga, T.

(7560) R VULPECULÆ—*continued.*

1923 Oct 21	3714	75	Pr	5+2, 4+5	8·3*b*
22	3715	22	Bl	=4	8·8
22	3715	55	Bg	3 (7) v (1) 5	8·4
23	3716	90	Bh	3−8, 5+4	8·2
25	3718	55	Bg	3 (3) v (2) 5	8·1*b*
26	3719	90	Bh	3−8, 5+4	8·2
27	3720	62	Wf	3−5, 5+7	7·9
28	3721	50	Bn	=e	8·1
30	3723	96	Gr	=5	8·6
31	3724	F	Wf	2 (1) v (1) 3	7·3
31	3724	45	Br	3−8, 4+3	8·4
Nov 2	3726	75	Pr	3−4, 5+6	7·9
3	3727	45	Bh	3−7, 5+5	8·1
4	3728	55	Bg	3 (3) v (1) 5	8·3
4	3728	30	D	3 (1) v (1) 5, 5+5	8·0
7	3731	90	Bh	3−7, 5+5	8·1
7	3731	50	Bn	e (2) v (1) f	8·3
8	3732	55	Bg	3 (1) v (1) 5	8·0*b*
10	3734	30	,,	e (3) v (1) f	8·4*b*
10	3734	90	Bh	3−5, 5+7	7·9
10	3734	30	D	3 (2) v (1) 5, 5+4	8·2
10	3734	79	Ma	2 (3) v (1) 8, 3 (4) v (1) 5	8·6
10	3734	75	Pr	3−1	7·5
10	3734	22	Bl	=P	8·4
10	3734	25	Bn	f−1	8·6
15	3739	55	Bg	=5	8·6
16	3740	90	Bh	3−5, 5+7	7·9
18	3742	50	Bn	f+1, 5+2	8·4
19	3743	22	Bl	P (4) v (2) 4	8·6
23	3747	90	Bh	3−8, 5+4	8·2
30	3754	,,	,,	5−2, 6+3	8·8
30	3754	50	Bn	5+1	8·5
30	3754	22	Bl	4 (1) v (5) 7	8·9
Dec 2	3756	75	Pr	4−3, 6+3	8·9
2	3756	90	Bh	5−2, 6+2	8·8
2	3756	55	Bg	6 (1) v (4) 11	9·2*b*
3	3757	45	Br	=5	8·6
5	3759	90	Bh	5−4, 6+2	8·9
8	3762	,,	,,	5−10, 19+2	9·6
9	3763	60	D	19+1	9·7
12	3766	150	Wf	=19	9·8
12	3766	90	Bh	6−10, 19−3	10·1*b*
18	3772	,,	,,	25−2, 31+3	10·6
20	3774	,,	,,	25−4, =31	10·8
24	3778	,,	,,	31−3, 40+3	11·1
28	3782	,,	,,	=40, =43	11·4
1924 Jan 3	3788	,,	,,	=49	11·6
3	3788	120	Br	57−2, 66+2	12·1
4	3789	94	Bl	57 (1·5) v (2·5) 71	12·1
6	3791	90	Bh	49−1, 59+3	11·7
6	3791	120	Bn	40 (3) v (1) 57	11·7
6	3791	65	Bg	31 (3) v (2) 40	11·2*b*
9	3794	157	Wf	57−1, 63+2	11·9
11	3796	90	Bh	=57, =59	11·9
17	3802	,,	,,	=66	12·3*b*
19	3804	30	Wf	57−3	12·1*b*
23	3808	90	Bh	66 (2) v (1) 78	12·6

Oct. 21, Yellow.
Nov. 4, D, 5ᶜ.
Jan. 6, Bg, About.
Jan. 19, Difficult.

1924 Jan 25	3810	150	Bn	=63	12·1*b*
26	3811	90	Bh	<59	<12·0*b*
27	3812	150	Bn	57−5, 63−1	12·3*b*
27	3812	94	Bl	=79	12·9*b*
Feb 8	3824	150	Wf	31−4, 40+2	11·2
10	3826	45	Bh	40−2, 43−1	11·6*b*
14	3830	90	,,	19−6, 25−1	10·4
22	3838	,,	,,	19−1	9·9
28	3844	22	Bl	7 (4) v (1) 11	9·5
Mar 6	3851	94	,,	4 (3) v (2) 7	9·1
12	3857	22	,,	4 (1·5) v (4·5) 7	8·9
14	3859	45	Bh	5 (2) v (1) 6	8·9
19	3864	,,	,,	=5	8·6*b*
26	3871	90	,,	3 (2) v (1) 5	8·2
30	3875	22	Bl	P+2·5	8·2
Apr 3	3879	90	Bh	5+2	8·4
6	3882	,,	,,	=5	8·6
11	3887	,,	,,	5−2, 19+10	8·8
14	3890	,,	,,	5−2	8·8
17	3893	94	Bl	4 (4) v (1) 7, =7	9·3*b*
20	3896	90	Bh	=6	9·1
24	3900	,,	,,	6 (1) v (1) 19	9·4
24	3900	62	Wf	=19	9·8
30	3906	90	Bh	19−2	10·0
May 3	3909	,,	,,	25−1, 31+3	10·5
5	3911	60	D	=35	11·0*b*
7	3913	62	Wf	31−2, 40+2	11·1
9	3915	94	Bl	=38	11·2
11	3917	157	Wf	40−1, 57+3	11·5
13	3919	90	Bh	=57, =59	11·9
16	3922	,,	,,	66+2	12·1
22	3928	,,	,,	66−1	12·4
25	3931	120	D	57−4	12·2*b*
25	3931	150	Wf	=63	12·1
26	3932	94	Bl	=57	11·8
28	3934	150	Wf	57−3, =63	12·1
June 1	3938	157	,,	71−4, 79+1	12·8
5	3942	94	Bl	57 (1·5) v (4·5) 79	12·1
6	3943	90	Bh	59−4	12·4
7	3944	150	Wf	71−2, 79+2	12·7
13	3950	90	Bh	40−2, 43−1, =49	11·6
16	3953	94	Bl	57+2	11·6
18	3955	90	Bh	31+1	10·8
23	3960	62	Wf	25−5, =31	10·9
23	3960	94	Bl	19 (3) v (3) 29	10·2
24	3961	90	Bh	19−2	10·0
26	3963	60	D	11−1, 19+2	9·6
27	3964	90	Bh	19+3	9·5
27	3964	62	Wf	19−3, 25+2	10·1
29	3966	94	Bl	11 (2) v (2) 19	9·7
30	3967	90	Bh	6−1, 19+5	9·2
July 2	3969	,,	,,	5 (2) v (1) 6	8·9
3	3970	62	Wf	9−1, =11	9·5
5	3972	90	Bh	5 (1) v (1) 6	8·8
6	3973	60	D	9+2	9·2
6	3973	94	Bl	4 (6) v (1) 7	9·3
7	3974	55	Bg	5 (2) v (1) 6	8·9

Jan. 26, Not seen.
May 5, Glimpsed.
July 6, Bl, With 22, 9·4.

(7560) R VULPECULÆ—*continued.*

1924					
July					
7	3974	62	Wf	5−5, 6+2	9·0*b*
9	3976	60	D	5−6, 9+3	9·1
9	3976	45	Bh	5−1	8·7
12	3979	,,	,,	=5	8·6
14	3981	,,	,,	5+2	8·4
15	3982	55	Bg	5 (1) v (4) 6	8·7
19	3986	,,	,,	=5	8·6*b*
19	3986	45	Bh	3 (3) v (1) 5	8·3
22	3989	62	Wf	5+1	8·5
23	3990	45	Bh	3 (1) v (1) 5	8·0
24	3991	55	Bg	e (3) v (1) f	8·4
25	3992	90	Bh	3 (1) v (2) 5	7·8
27	3994	45	,,	3 (1) v (2) 5	7·8
27	3994	62	Wf	3 (4) v (6) 5	7·9
29	3996	45	Bh	3 (1) v (3) 5	7·7
31	3998	,,	,,	3 (1) v (3) 5	7·7
31	3998	60	D	3 (3) v (2) 5, 5+5	8·1
Aug					
1	3999	F	Wf	2−3, =3	7·5
2	4000	60	D	3 (2) v (3) 5, 3−5	7·9*b*
2	4000	45	Bh	2−2, =3	7·4
5	4003	,,	,,	=2, =3	7·3*b*
5	4003	50	Bn	=e	8·1
6	4004	62	Wf	=3	7·4
7	4005	30	Bg	3 (1) v (1) e	7·8
7	4005	90	Bh	2−2, =3	7·4
8	4006	30	D	3 (1) v (3) 5, 3−3	7·7
9	4007	22	Bl	3 (3) v (4) P	7·9
9	4007	45	Bh	3 (1) v (3) 5	7·7
10	4008	62	Wf	2−4, 3−1	7·6
15	4013	90	Bh	3 (1) v (3) 5	7·7
18	4016	30	Bg	3 (1) v (2) e	7·7
19	4017	60	D	3 (1) v (1) 5, 5+6	8·0
19	4017	90	Bh	3 (1) v (1) 5	8·0
19	4017	50	Bn	e+1	8·0
22	4020	45	Br	3−8, 4+5	8·3
22	4020	30	Bg	e (1) v (1) f	8·3
23	4021	62	Wf	3−4, 5+6	7·9
25	4023	45	Bh	5 (2) v (1) 6	8·9
26	4024	62	Wf	3 (9) v (1) 5	8·5
27	4025	90	Bh	=5	8·6
27	4025	60	D	3 (4) v (1) 5, 5+3	8·3
31	4029	55	Bg	5 (1) v (2) 6	8·7
31	4029	62	Wf	5−2, 6+3	8·8
Sept					
2	4031	90	Bh	=6	9·1
6	4035	94	Bl	4 (4·5) v (1·5) 7	9·2
7	4036	62	Wf	9+1, 11+2	9·3*b*
8	4037	90	Bh	19+1	9·7
14	4043	,,	,,	19−3	10·1
17	4046	,,	,,	19 (1) v (1) 31, =25	10·3
22	4051	94	Bl	=57	11·8
22	4051	120	D	=45	11·5
22	4051	75	Bg	=49	11·6*b*
22	4051	100	Si	=40	11·4
24	4053	,,	,,	=40	11·4*b*
26	4055	120	D	43−1	11·5*b*
26	4055	90	Bh	43 (1) v (1) 57, =49	11·6
26	4055	62	Wf	40−3, =57	11·8
27	4056	120	Bn	57 (2) v (1) 63	12·0
29	4058	94	Bl	57 (1) v (5) 79	12·0
29	4058	T	Bk	=59, =63	12·1*b*
29	4058	90	Bh	59−2, 66+1	12·2

July 9, Aug. 19, D, 5c.
July 31, D, 7c.
Aug. 2, D, 6c.
Aug. 8, 4c.

Oct					
1924					
1	4060	90	Bh	=66	12·
5	4064	157	Wf	71−4, 78+1	12·
8	4067	75	Bg	<49	<11·
11	4070	120	Br	<66	<12·
11	4070	94	Bl	Estimated	<12·
13	4072	150	Bh	66−5	12·
16	4075	T	Bk	78−6	13·
16	4075	231	Wf	Estimated	13·
17	4076	94	Bl	Estimated	<13·
23	4082	75	Bg	<78	<12·
23	4082	T	Ba	78−5	13·
23	4082	90	Bh	<75	<12·
24	4083	,,	,,	59−5	12·
27	4086	,,	,,	59−4	12·
28	4087	100	Si	<79	<12·
30	4089	,,	,,	<66	<12·
31	4090	90	Bh	59−3	12·
Nov					
3	4093	,,	,,	57−3, 59−1	12·
3	4093	150	Bn	<66	<12·
5	4095	94	Bl	Estimated	<12·
8	4098	90	Bh	57−1	11·
15	4105	,,	,,	=40, =43	11·
15	4105	T	Bk	40−6, 49−2, =57	11·
15	4105	94	Bl	38 (3) v (3) 57	11·
17	4107	100	Si	=40	11·
17	4107	75	Bg	40 (1) v (1) 49	11·
24	4114	90	Bh	19 (2) v (1) 31, 25 (3) v (1) 31	10·
27	4117	T	Bk	=19	9·
27	4117	55	Bg	19 (1) v (2) 25	10·
28	4118	90	Bh	19 (2) v (1) 25	10·
30	4120	100	Si	=19	9·
Dec					
3	4123	94	Li	=9	9·
4	4124	T	Bk	11−1, 19+1	9·
5	4125	90	Bh	19−1	9·
5	4125	94	Bl	=11	9·
6	4126	75	Bg	11 (3) v (1) 19	9·
6	4126	44	Li	=11	9·
9	4129	90	Bh	19+2	9·
10	4130	94	D	=11	9·
12	4132	T	Bk	=9, 11+2	9·
13	4133	44	Li	=9	9·
13	4133	90	Bh	19+2	9·
15	4135	,,	,,	19+3	9·
19	4139	,,	,,	5 (1) v (1) 6	8·
19	4139	60	Si	5 (3) v (2) 9	9·
20	4140	T	Bk	5−2	8·
22	4142	60	Si	5 (3) v (2) 9	9·
22	4142	90	Bh	=5	8·
24	4144	t	Bk	5−1, 4+1	8·
25	4145	90	Bh	3 (3) v (1) 5	8·
26	4146	55	Bg	5 (1) v (2) 6	8·
26	4146	100	Si	=5	8·
29	4149	22	Bl	4+0·5	8·
29	4149	55	Bg	=5	8·
30	4150	90	Bh	=5	8·
31	4151	,,	,,	5+1	8·

Oct. 8, Difficult.
Oct. 11, Br, Not seen.
Oct. 23, Bh, Not seen.
Nov. 3, Bn, Glimpsed.
Nov. 8, Glimpsed.
Dec. 4, 12, 6c.
Dec. 20, With t., 8·8.

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VOL. XXIX.—PART I.

TWENTY-FOURTH REPORT OF THE SECTION
FOR THE OBSERVATION OF
JUPITER.
APPARITIONS 1922, 1923 and 1924.

Director—Rev. T. E. R. Phillips, M.A., F.R.A.S.

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OF

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TWENTY-FOURTH REPORT OF THE SECTION.

APPARITIONS OF 1922, 1923 and 1924.

INTRODUCTION.

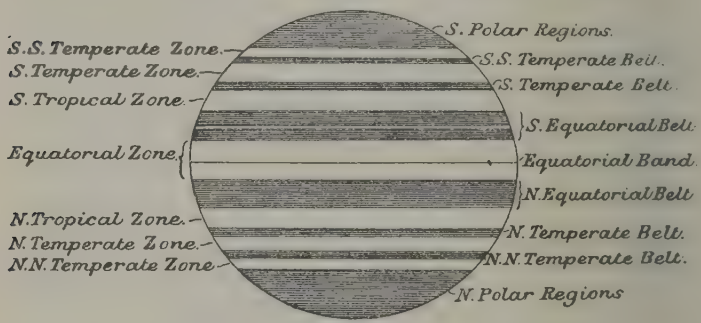
This Report contains the results of the Section's work during three apparitions. Owing to the Planet's increasingly poor position in the sky for Northern Observers, and the fact that no observations have been received from the Southern Hemisphere, the material for discussion has unfortunately been rather scanty, but advantage has been taken of the opportunity thus presented to get forward with the work of publication, and it is hoped in the next Memoir to overtake arrears still further.

Below will be found a list of those who have contributed observations and notes relating to one or more of the three apparitions here reviewed, together with a statement as to their locality and instrumental equipment While grateful acknowledgment is made of the work of all, the Director would particularly mention the contributions of (*a*) three of the older members of the Section—Messrs. Attkins, Ryves, and Sargent, and (*b*) a new member—Mr. B. M. Peek. In addition to descriptive notes and drawings—Mr. Attkins made as many as 54 whole disc drawings in 1922—these gentlemen have supplied very valuable transit observations at a time when they were specially needed. It is a very great pleasure to welcome to the Section so enthusiastic and excellent an observer as Mr. Peek, and the Director

is still further indebted to him for valuable help in the preparation of this Report.

Name.	Locality.	Instruments used.
ATTKINS, E. A. L., F.R.A.S.	Squirrels' Heath, Essex	8½-in. spec.
BOUGON, Capt. J.	Amiens, France	4-in. O.G. and 10-in. spec.
BRIDGER, J. H., Mus.B.	Croydon	8½-in. spec.
LEPPER, Capt. G. H., F.R.A.S.	Harrow	6½-in. spec.
MARTHERAY, C. F. DU	Nyon, Switzerland	8½-in. spec.
PEEK, B. M., M.A., F.R.A.S.	Boscombe	5-in. O G., and 12½-in. spec.
PHILLIPS, Rev. T. E. R., M.A., F.R.A.S.	Headley, near Epsom	8-in. O.G., and 12¼-in. spec.
SARGENT, F., F.R.A.S.	Durham	5-in. O.G., and 10-in. spec.
RYVES, P. M., F.R.A.S.	Tenerife	10½-in. spec.
WILLIAMS, A. S., F.R.A.S.	St. Mawes, Cornwall	6½-in. spec.

The nomenclature adopted in this Report is the same as in former years, and is given in the accompanying diagram.



Greenwich Mean Time (reckoned from Noon) is used throughout this Memoir.

Symbols used:—ω = longitude; λ = longitude of central meridian (C.M.); $\mathcal{S}$ = opposition.

APPARITION OF 1922.

Date of Opposition: 1922 April $4^d\ 2^h$.
Position of Planet: R.A. $12^h\ 54^m$ Dec. $-4°\ 3'$.
Equatorial Diameter: $44''{\cdot}2$.
Zenocentric declination of the Sun: $-2°{\cdot}6$.
Zenocentric latitude of centre of Planet's disc as seen from the Earth: $-3°{\cdot}3$.

NOTES ON THE GENERAL APPEARANCE OF THE DISC, COLOURS, &c.

N. Polar Regions.—Quiet and featureless.

N.N. Temperate Belt.—Very faint and almost invisible.

N. Temperate Belt.—Strong and rather broad in places, but broken up into dark spots and streaks. Not visible in all longitudes.

N. Tropical Zone.—A narrow belt seen on the Zone by the Director on April 4 (Plate I., fig. 1), and by Du Martheray (Plate II., fig. 4).

N. Equatorial Belt.—Broad and dark, with complex structure in places. Dark spots and white openings along S. edge, with occasional rifts through the belt. Several well-defined white spots at or just within N. edge. A pair of these ($\omega_2 = 349°$ and 359 at opposition) exhibited unusually rapid motion for the latitude till near end of May. Several dark spots and condensations also observed on N. component. A short series of colour estimates by Williams gives a mean *redness* of 1·8 on his scale for this belt as against 2·1 for the S. Equatorial Belt. Both belts appeared *brownish* to Lepper, but especially the N. Equatorial Belt. The Director considered the latter *grey* on January 10, when the S. Equatorial Belt was described as exhibiting a "somewhat *warm* tone."

Equatorial Zone.—Some dusky shadings and wisps enclosing white areas, especially near S. edge of N. Equatorial Belt. Very little colour on the Zone. Williams sometimes observed traces of the tawny hue of 1919-20 and earlier part of previous apparition, but at other times the Zone appeared quite white.

S. Equatorial Belt.—Components often, but not always, seen separated. Some details in the form of dark spots observed at S. edge by Du Martheray, Peek and the Director; also a conspicuous white spot recorded by the same observers and Atkins in centre of belt. Bougon shows a number of transverse dark and light streaks (Plate I., fig. 2). N. edge broken up in places, particularly in region associated with a very dark spot (*see* paper by Sargent, *M.N.* **82**, p. 418) projecting into Equatorial Zone and, with accompanying objects, exhibiting an abnormally long rotation period similar to that of Sargent's spot of previous apparition (Plate I., figs. 1, 3, 4, 5, 6; Plate II., figs. 3, 5; Plate III., fig. 2). The belt somewhat *red* in colour—rather more so than N. Equatorial Belt—but tone not very strongly marked. (*See* note above on N. Equatorial Belt.) Du Martheray considered it less red than in 1921.

Red Spot and Hollow.—Hollow well defined, with wisps connecting the *p* and *f* "shoulders" with S. Temperate Belt

seen by Attkins, Bougon, Du Martheray, Peek and the Director. Attkins describes the Hollow as white in *p* half and shaded in *f* half (Plate III., fig. 1). Red Spot itself very faint, but seen as a definite ellipse by Du Martheray (Plate II., fig. 4). Williams and the Director. Longitude at opposition = 256° (Sys. II.).

S. Tropical Zone.—Little detail visible apart from the Disturbance. The Zone recorded by the Director as "brightest part of the disc" on January 10.

S. Tropical Disturbance.—Dark and well defined at *p* and *f* ends, but faint and indefinite in central regions. Length 145° in middle of March, increasing to about 151° at end of August. Longitudes of *p* and *f* ends = 337° and 121° at opposition (Sys. II.). The Disturbance observed to be preceded and followed (Plate II., fig. 3) by white areas. Du Martheray noted irregularities and variations in form of the dark area immediately following the *p* end.

S. Temperate Belt.—Very much narrower but usually more intense than the S.S. Temperate Belt. Seen double by the Director on May 21, but single in most longitudes. Little detail recorded apart from a few condensations and one well-observed white spot. Colour of belt *grey* to Lepper, *brown* to Williams; condensations *brown* to Du Martheray.

S.S. Temperate Belt.—Broad and irregular in some longitudes. In others often observed to be widely double, with some dark condensations and white spots. A few white spots and areas also seen bordering the belt on S. Temperate Zone.

S. Polar Regions.—Recorded by the Director as strongly shaded on January 10, but generally quiet and without definite features.

LATITUDES OF THE BELTS.

The Director measured the positions of the belts with the micrometer of the 8-in. equatorial refractor on two nights. The measures, as in former years, have been reduced to zenographical latitude.

The most important change shown by the measures is the greatly increased breadth of the N. Equatorial Belt, viz., from about $6\frac{1}{2}°$ in 1921 to $14\frac{1}{2}°$ in 1922. This increase was brought about by the extension polewards of the N. portion of the belt to a higher latitude than had previously been recorded by the Director. Accompanying this development of the N. Equatorial Belt was a displacement northwards of the N. Temperate Belt.

MEASURES BY THE DIRECTOR.

Part Measured.	April 6. Fraction of Polar Semi-diameter from Centre of Disc.	April 6. Zeno-graphical Latitude.	May 19. Fraction of Polar Semi-diameter from Centre of Disc.	May 19. Zeno-graphical Latitude.	Mean Zenographical Latitude.
		°		°	°
N. Temp. Belt	+·522	+30·0	+·552	+32·4	+31·2
N. Equat. Belt N.	+·378	+20·4	+·422	+23·6	+22·0 } +14·8
N. Equat. Belt S.	+·185	+ 8·1	+·161	+ 6·9	+ 7·5 }
S. Equat. Belt N.	—·059	— 6·9	—·043	— 5·7	— 6·3 } −12·2
S. Equat. Belt S.	—·246	—18·4	—·246	—18·1	—18·2 }
S. Temp. Belt	—·392	—27·6	—·375	—26·3	—27·0
S.S. Temp. Belt	—·579	—40·4	—·565	—39·1	—39·8

ROTATION PERIODS.

The following are the points of special importance disclosed by this department of the Section's work:—

1. An interesting feature of the apparition was the reappearance after four years of some dark condensations on the N. Temperate Belt, of which transit observations could be or were obtained. The rotation period deduced was about the normal for the latitude.

2. In the previous *Memoir* (Twenty-third Report of the Section, p. 80) attention was drawn to the steadiness since 1914 of the N. Tropical Current, the mean rotation period for the seven apparitions, 1914 to 1920-21, being $9^h\ 55^m\ 29^s{\cdot}3$ with but small deviations in the yearly values. In the apparition here discussed the mean period dropped to $9^h\ 55^m\ 20^s{\cdot}6$, but it must be noted that this result was due entirely to a few spots which for several weeks exhibited an abnormally rapid drift. It is to be noted, too, that these objects were actually situated within the N. edge of the belt, and were probably influenced to a considerable extent by the swifter current further south. The remainder of the spots had a mean period of $9^h\ 50^m\ 29^s$.

3. During the apparition of 1920-21 the N. Equatorial Spots had shown a very large increase in length in rotation period as compared with the figures deduced since the great outbreak of spots in 1913. Those of the apparition under review indicated that this slower rate of motion was only partially maintained, the period being about half way between those of 1919-20 and 1920-21.

4. The apparition of 1922 was the fifth in succession during which S. Equatorial spots were observed with unusually long rotation periods. No individual spot rotated quite so slowly as Sargent's spot of the previous year, but all four that were observed had periods in excess of $9^h\ 51^m$, and their mean period was longer than has been recorded for at least more than 40 years!

In column 2 of the following Tables D = dark, W = white. In column 3 the inclusion of figures in brackets indicates that the spot was not observed, or did not exist, at the time of opposition. The opposition longitude is inferred for the sake of convenience from the previous or subsequent motion of the object.

N. TEMPERATE SPOTS.

No.	Description.	Longitude at δ ω_2 °	Limiting Dates.	No. of Observations.	Approx. Change of Longitude in 30 days. °	Rotation Period. h m s
1	D - -	111	Mar. 27–May 23	4	+ 12	9 55 57·1
2	D - -	337	Mar. 25–May 10	3	+ 10	9 55 54·3
	,, (f end)	345	Mar. 20–April 20	4	+ 22	9 56 10·7

Adopted Mean Rotation Period = 9h 55m 55s·7

N. TROPICAL SPOTS.

		ω_2 °				
1	W - -	90	Apr. 4–June 25	14	— 12	9 55 24·2
2	W - -	140	Apr. 4–May 23	4	— 7	9 55 31·0
3	D - -	148	Mar. 9–June 11	8	— 10	9 55 26·9
4	W - -	216	Mar. 9–May 17	3	— 5	9 55 33·8
5	W - -	349	Mar. 25–May 24	2	— 27	9 55 3·7
			May 24–June 19	2	— 12	9 55 24·2
6	D - -	354	Mar. 25–May 24	2	— 27	9 55 3·7
7	W - -	359	Mar. 25–May 29	8	— 25	9 55 5·0
			May 29–July 11	6	— 12	9 55 24·2

Mean Rotation Period for Spots 1—4 9h 55m 29s·0.
Mean Rotation Period for Spots 5—7 9h 55m 12s·2.
Adopted Mean Rotation Period = 9h 55m 20s·6.

N. EQUATORIAL SPOTS.

No.	Description.	Longitude at δ	Limiting Dates.	No. of Observations.	Approx. Change of Longitude in 30 days.	Rotation Period.
		ω_1 °			°	h m s
1	D - -	14	Jan. 10–Sept. 6	7	+ 1	9 50 31·3
2	W - -	33	Jan. 31–June 2	4	+ 4	9 50 35·4
3	D - -	57	Jan. 17–Sept. 6	17	— 1	9 50 28·7
4	W - -	78	Jan. 31–June 9	7	0	9 50 30·0
5	D - -	(96)	Apr. 6–July 18	11	— 6	9 50 22·0
6	W - -	(101)	Apr. 6–May 15	4	— 3	9 50 26·0
7	D - -	(111)	Apr. 29–June 25	5	— 3	9 50 25·3
8	D - -	(134	Apr. 4–Aug. 1	6	— 3	9 50 25·6
9	D - -	(170	Apr. 9–June 21	10	— 5	9 50 23·3
10	D - -	204	Mar. 25–July 12	10	— 3	9 50 25·3
11	D - -	240	Mar. 25–June 1	11	— 6	9 50 21·5
12	D - -	264	Feb. 6–May 30	8	— 5	9 50 22·7

Mean Rotation Period = 9h 50m 26s·4.

S. EQUATORIAL SPOTS.

		ω_1 °				
1	W - -	172	Apr. 3–June 17	7	+ 32	9 51 13·7
2	D - -	176	Apr. 3–June 29	24	+ 35	9 51 17·1
3	W - -	189	Apr. 20–June 17	3	+ 33	9 51 14·4
4	D - -	197	Apr. 20–June 17	3	+ 33	9 51 14·4

Mean Rotation Period = 9h 51m 14s·9.

SPOT IN S. EQUATORIAL BELT.

		ω_2 °				
	W - -	(236)	Apr. 24–July 3	9	— 13	9 55 22·4

RED SPOT HOLLOW.

		ω_2 °				
1	p shoulder	240	Apr. 7–Aug. 18	22	— 1	9 55 39·3
2	Centre -	256	Feb. 6–Sept. 4	27	— 1·3	9 55 38·9
3	f shoulder	271	Apr. 7–Sept. 4	25	— 1	9 55 39·3

Mean Rotation Period = 9h 55m 39s·1.

S. TROPICAL DISTURBANCE.

		ω_2 °				
1	p end -	337	Feb. 7–Aug. 28	40	— 7·0	9 55 31·0
2	f end -	121	Jan. 31–Aug. 29	37	— 6·0	9 55 32·4

Mean Rotation Period = 9h 55m 31s·7.

S. TEMPERATE SPOTS.

No.	Description.	Longitude at ω_2	Limiting Dates.	No. of Observations.	Approx. Change of Longitude in 30 days.	Rotation Period.
		°			°	h m s
1	W - -	316	Feb. 7–June 19	12	— 18·7	9 55 15·0
2	*p* end thickening of belt	(321)	June 12–July 16	4	— 19	9 55 15·0

Mean Rotation Period = 9h 55m 15s·0.

S.S. TEMPERATE SPOTS.

		°				
D	*p* end	326	Mar. 25–June 12	2	— 22	9 55 10·5
	f end	356	Apr. 1–June 29	4	— 22	9 55 10·9

Mean Rotation Period = 9h 55m 10s·7.

SUMMARY.

Current.	1918–19.		1919–20.		1920–21.		1922.	
	Rotation Period.	No. of Objects.	Rotation Period.	No. of Objects.	Rotation Period.	No. of Objects.	Rotation Period.	No. of Objects.
	h m s		h m s		h m s		h m s	
N. Polar Spots	9 55 42·0	1	9 55 42·7	1	—	—		
N.N. Temp. Spots	9 55 41·3	3	—	—	9 55 36·5	1	—	—
N. Temp. Spots	—	—	—	—	—	—	9 55 55·7	2
N. Trop. Spots	9 55 27·7	10	9 55 30·9	9	9 55 28·5	2	9 55 20·6*	7
N. Equat. Spots	9 50 19·4	22	9 50 17·9	6	9 50 34·3	10	9 50 26·4	12
S. Equat. Spots	9 50 46·8	2	9 51 0·3	3	9 50 49·4	5	9 51 14·9	4
Spots in S.E.B.	9 55 45·6	2	—	—	—	—	9 55 22·4	1
Red Spot or Hollow	9 55 36·9	3	9 55 34·6	2	9 55 37·6	3	9 55 39·1	3
S. Trop. Dist.	9 55 30·5	7	9 55 30·9	2	9 55 31·7	2	9 55 31·7	2
Other S. Trop. Objects	–	—	(See 22nd Report)	—			–	
S. Temp. Spots	9 55 21·8	4	9 55 11·9	4	9 55 16·6	3	9 55 15·0	2
S.S. Temp. Spots	9 55 5·4	4	9 55 6·0	3	9 55 9·0	2	9 55 10·7	1
S. Polar Spots							–	

* Mean Rotation Period for Spots 1 to 4 9h 55m 29s·01; for Spots 5 to 7 9h 55m 12s·2

See pp. 5 and 6 (Table).

SATELLITE OBSERVATIONS.

A few observations of Satellite phenomena were made by members of the Section. As regards eclipses, as has been pointed out on various occasions, only photometric observations which give the light curve of the satellite are really of much value to computers, since the moment when a Satellite is last or first seen will naturally depend on a variety of circumstances, such as the aperture of the instrument, the state of the atmosphere, and the acuteness of the observer's vision. But any unusual or outstanding phenomena should always be put on record.

The Director measured on a few occasions the P.A. of apparent elongation of the disc of III. in different positions in its orbit. The results are in accord with those obtained in 1921 and previous years (see *M.N.R.A.S.* **82**, *p.* 97, and *Twenty-Third Report of the Section*), and there is no need to give details here

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APPARITION OF 1923.

Date of Opposition: 1923 May 5^d 2^h.

Position of Planet: R.A. 14^h 48^m Dec. -14° 48′.

Equatorial Diameter: 44″·7.

Zenocentric declination of the Sun: $-3^\circ{\cdot}1$.

Zenocentric latitude of centre of Planet's disc as seen from the Earth: $-3^\circ{\cdot}7$.

NOTES ON THE GENERAL APPEARANCE OF THE DISC, COLOURS, &c.

N. Polar Regions.—Quiet. Colour *pale grey*.

N.N. Temperate Belt.—Very faint, discontinuous, and often indistinguishable from S. edge of N. Polar shading.

N. Temperate Belt.—Broad and fairly strong in places, but in some longitudes invisible or extremely faint.

N. Tropical Zone.—No distinctive features recorded.

N. Equatorial Belt.—Strong, double in certain longitudes, and well defined as a rule. Except, perhaps, during the earlier part of the apparition the darkest of the belts. Many irregularities along its S. edge with some transverse rifts. A few white oval spots at or near its N. edge as in 1922.

Colour described by Lepper as *sepia brown*; by the Director as *rather warm grey*, or *warm brown*. On June 6 he described the colour as seen in the 12¼-in. as "*warmish sepia passing through reddish brown to yellowish orange* towards N. edge." On the whole the redness of the belt seems to have been about equal to that of the S. Equatorial Belt.

Equatorial Zone.—Generally quiet and undisturbed apart from the usual greyish wisps enclosing some white areas, the latter being most conspicuous along the S. edge of N. Equatorial Belt. Colour of Zone, *white*.

S. Equatorial Belt.—Considered by the Director on Feb. 4 to be the darkest belt, but later decidedly less dark than N. Equatorial Belt. The S. edge often hazy and ill defined in the longitudes of the S. Tropical Disturbance, with some dark condensations and projections into S. Tropical Zone. N. component dark in places with some irregularities, and in some longitudes widely separated from S. component. The belt much broken up at times, and two prominent dark objects projecting into Equatorial Zone in longitudes 154° and 327° (Sys. I.) at opposition recorded by Peek (Plate IV., fig. 5, near *f* limb), Sargent (Plate IV., fig. 4) and the Director. Colour of belt described by Lepper as *brown*, by the Director as *warmish sepia* or *warm brown*.

Red Spot and Hollow.—The Hollow well defined but rather shallow. The Red Spot itself very faint and difficult. Glimpsed by the Director on June 11 as "the feeblest possible elliptical ring enclosing a very lightly shaded area." The spot seen again distinctly by him on July 5, and glimpsed on a few occasions by Peek. Lepper with his smaller aperture considered the Hollow *very white*. Longitude at opposition = 230° (Sys. II.).

S. Tropical Disturbance.—The *p* end almost in conjunction with Red Spot Hollow when first observed by Sargent on Dec. 22; invisible later after conjunction had begun. Some delicate shadings seen on the Zone on the *p* side of the Hollow by Peek and the Director on May 3 (Plate IV., fig. 2), but they were not permanent, and probably not connected with the *p* end of the Disturbance. The part of the latter following the Hollow rather faint in places, but the *f* end itself sharply defined as in 1922 and followed by a very bright spot. A curious development seen at *f* end by the Director on May 4 (Plate IV., fig. 3) and by Peek on June 7 (Plate IV., fig. 6). Longitude of *f* end at opposition = 32° (Sys. II.).

S. Tropical Zone.—Generally *very white*. The region *f* the Disturbance the brightest part of the disc. On July 7 Peek noticed that the portion of the S. Temperate Belt *p* the Red Spot Hollow seemed abnormally thick, having apparently extended itself in a northerly direction, thus causing the S. Tropical Zone ahead of the Hollow to appear narrower than usual.

S. Temperate Belt.—Varied greatly in different longitudes. In some places broken up into short streaks, in others broad and diffuse, with one very dark and well-defined region terminating at longitude 312° (Sys. II.) at opposition. A white spot at S. edge and a well-marked thickening of the belt had survived from 1922 and were in longitude 90° ± (Sys. II.) at opposition. Colour of belt, *grey*.

S.S. Temperate Belt.—Broad and generally somewhat diffuse as in 1922. One well-defined detached spot near N. edge on S. Temperate Zone in longitude 26° (Sys. II.) at opposition (Plate III., fig. 6; Plate IV., fig. 3).

S. Polar Regions.—Quiet. *Pale grey* in colour.

LATITUDES OF THE BELTS.

Three sets of measures were made by the Director with the 8-in. refractor, and, as in former years, they have been reduced to zenographical latitude. No noteworthy change is revealed by the figures, though a slight retreat southwards of the N. Equatorial Belt is suggested, especially its N. edge.

Some measures of the Equatorial belts were also made by Peek on two occasions with his 5-in. refractor and Cooke micrometer, and are included in the Table.

LATITUDES OF THE BELTS.

Observer.	1923. Date.	N. Temp. Belt.		N. Equat. Belt.			S. Equat. Belt.			S. Temp. Belt.	
				N. Edge.		S. Edge.	N. Edge.		S. Edge.		
		Fraction of semi-diam. from centre of disc.	Zenograph. latitude.	Fraction of semi-diam. from centre of disc.	Zenograph. latitude.	Fraction of semi-diam. from centre of disc.	Zenograph. latitude.	Fraction of semi-diam. from centre of disc.	Zenograph. latitude.	Fraction of semi-diam. from centre of disc.	Zenograph. latitude.
The Director	March 13	—	° —	+·384	° +20·3	+·156	° +5·9	−·034	° −5·6	−·231	° −17·0	−·386	° −27·7
	June 6	+·509	+28·8	+·384	+20·4	+·155	+5·9	−·039	−6·0	−·236	−18·3	−·398	−28·5
	July 5			+·345	+18·1	+·163	+6·6	−·058	−6·9	−·276	−20·4	−·447	−31·4
	Means		+28·8		+19·6		+6·1		−6·2		−18·5		−29·2
						° +12·8				° −12·4			
B. M. Peek	April 26	—	—	+·358	+18·5	+·204	+8·8	—	—	—	—	—	—
	May 25			+·381	+20·5	+·179	+7·3	−·041	−6·2	—	—	—	—
	Means				+19·5		+8·1		−6·2				
						° +13·8							

ROTATION PERIODS.

Despite the poor position of the Planet in the sky for Northern Observers, a considerable amount of material is available for discussion under this heading, thanks largely to an extremely valuable series of transit observations by Peek, who was able to continue his work later in the season than the Director. The result is that the more important features were adequately observed, and a number of other objects were seen and recorded often enough to eliminate doubt as to the identifications. Attention is drawn to the following points:—

1. One of the most important features of the apparition was the continuance of the slow rotation shown by certain South Equatorial Spots since 1917-18. Identity of the objects observed in successive years seems impossible, but in each of the six apparitions that have since elapsed at least a portion of the region bordering the N. edge of the S. Equatorial Belt has rotated slowly—and in some cases abnormally slowly—for the latitude.

2. During the apparition here discussed the N. portion of the great Equatorial Current, *i.e.*, the region about the S. edge of the N. Equatorial Belt, exhibited a very remarkable acceleration. A change had set in during the 1922 presentation; but in 1923 the observations show a general diminution in the rotation period of over a quarter of a minute. It might be thought that the identifications are at fault, but it appears impossible to link up the plotted positions of the individual spots in any other way, and it will be noted that similar results are yielded by the observations of 1924. The Director accordingly feels assured that the deduced acceleration is real; and that there has been a return to the rapid drift of N. Equatorial Spots shown at the time of the great revival of activity in this latitude in 1913.

3. It will be seen that the figures in the Table of N. Tropical Spots indicate a continuance of the accelerated motion shown by a portion of this region of the disc in 1922. The more slowly rotating dark Spot No. 3 was situated *within* the N. Equatorial Belt, and not actually at its N. edge. It did not develop, apparently, till towards the middle of July.

4. The two objects belonging to the S. Temperate current observed in 1922, viz., the *p* end of a thickening of the S. Temperate Belt and a white spot at its S. edge (*see* S. Temperate Spots, p. 8) survived the period of the Planet's invisibility, and were again seen and well observed till the end of July and middle of June respectively. Their rotation periods showed a slight increase in length as compared with the 1922 figures, but the other two spots recorded had unusually short periods for the latitude.

5. The Red Spot exhibited a slight acceleration in its rotation after the beginning of May. This is in accordance with its behaviour on all previous occasions on which it has been in conjunction with the S. Tropical Disturbance.

In column 2 of the following Tables D = dark, W = white. In column 3 the inclusion of figures in brackets indicates that the object was not observed, or did not exist, at the time of opposition. The opposition longitude is inferred for the sake of convenience from the previous or subsequent motion of the object.

N. TROPICAL SPOTS.

No.	Description.	Longitude at δ	Limiting Dates.	No. of Observations.	Approx. Change of Longitude in 30 days.	Rotation Period.
		ω_2 °			°	h m s
1	W - -	30	Feb. 8–July 25	13	— 14	9 55 21·5
2	W - -	(295)	June 10–Aug. 17	8	— 15	9 55 20·1
3	D - -	(290)	July 14–Aug. 12	5	— 7	9 55 31·0
4	W - -	327	Apr. 17–Aug. 12	14	— 14	9 55 21·5

N. EQUATORIAL SPOTS.

			ω_1 °				
1	W - -	(12)	Mar. 13–May 3	3	— 16	9 50 8·5
2	D - -	98	Apr. 3–May 24	4	— 16	9 50 8·5
3	D - -	165	May 1–June 4	4	— 19	9 50 4·4
4	D - -	186	Apr. 25–Aug. 15	7	— 14	9 50 11·2
5	D - -	(226)	May 29–July 21	6	— 14	9 50 11·2
6	W - -	249	May 4–July 21	5	— 15	9 50 9·8
7	D - -	264	Apr. 27–June 17	6	— 15	9 50 9·8
8	D - -	285	Apr. 7–Aug. 2	12	— 13	9 52 12·5
9	D - -	(311)	May 9–Aug. 2	8	— 12	9 50 13·9
10	D - -	(342)	May 6–Aug. 2	7	— 17	9 50 7·1

Mean Rotation Period = 9h 50m 9s·7.

S. EQUATORIAL SPOTS.

			ω_1 °				
1	W - -	(144)	Feb. 4–May 1	5	+ 24	9 51 2·3
2	D - -	154	Feb. 4–May 24	9	+ 24	9 51 2·3
3	W - -	313	May 30–June 10	5	+ 3	9 50 34·0
4	D - -	327	May 30–June 20	22	+ 3	9 50 34·0

Mean Rotation Period = 9h 50m 48s·1.

RED SPOT HOLLOW.

			ω_2 °				
1	p shoulder	216	Mar. 13–July 17	11	— 3	9 55 36·5
2	Centre -	230	Feb. 21–July 22	15	— 2·7	9 55 36·8
3	f shoulder	244	Mar. 13–Aug. 15	27	— 3	9 55 36·8

Adopted Rotation Period = 9h 55m 36s·8.

S. TROPICAL DISTURBANCE.

No.	Description.	Longitude at ω_2	Limiting Dates.	No. of Observations.	Approx. Change of Longitude in 30 days.	Rotation Period.
		°			°	h m s
	p end -	In conjunction with Red Spot Hollow.				
	f end	32	Jan. 3–Aug. 28	30	— 6·5	9 55 31·7

S. TEMPERATE SPOTS

		ω_2 °				
1	D - -	62	May 9–June 17	4	— 22	9 55 10·5
2	W - -	92	Jan. 16–June 17	4	— 15·5	9 55 19·4
3	*p* end thickening of belt	96	Jan. 16–July 28	14	— 15·5	9 55 19·4
4	*f* end dark part of belt	312	Apr. 17–May 21	7	— 24	9 55 7·8

Mean Rotation Period = 9h 55m 14s·3.

S.S. TEMPERATE SPOT.

		ω_2 °				
	D - -	29	Apr. 27–May 21	4	— 24	9 55 7·8

SUMMARY.

Current.	1919–20.		1920–21.		1922.		1923.	
	Rotation Period.	No. of Objects.	Rotation Period.	No. of Objects.	Rotation Period.	No. of Objects.	Rotation Period.	No. of Objects.
	h m s		h m s		h m s		h m s	
N. Polar Spots	9 55 42·7	1	—	—	—	—	—	—
N.N. Temp. Spots	—	—	9 55 36·5	1	—	—	—	—
N. Temp. Spots	—	—	—	—	9 55 55·7	2	—	—
N. Trop. Spots	9 55 30·9	9	9 55 28·5	2	9 55 20·6*	7	9 55 23·5	4
N. Equat. Spots	9 50 17·9	6	9 50 34·3	10	9 50 26·4	12	9 50 9·7	10
S. Equat. Spots	9 51 0·3	3	9 50 49·4	5	9 51 14·9	4	9 50 48·1	4
Spots in S.E.B.	—	—	—	—	9 55 22·4	1	—	—
Red Spot or Hollow	9 55 34·6	2	9 55 37·6	3	9 55 39·1	3	9 55 36·8	3
S. Trop. Dist.	9 55 30·9	2	9 55 31·7	2	9 55 31·7	2	9 55 31·7	1
Other S. Trop. Objects	(See 22nd Report)	—	—	—	—	—	—	—
S. Temp. Spots	9 55 11·9	4	9 55 16·6	3	9 55 15·0	2	9 55 14·3	4
S.S. Temp. Spots	9 55 6·0	3	9 55 9·0	2	9 55 10·7	1	9 55 7·8	1
S. Polar Spots	—	—	—	—	—	—	—	—

* See pp. 5 and 6 (Table).

SATELLITE OBSERVATIONS.

Lepper has reported further observations of Satellite IV. He notes that the light of this Satellite is much more dimmed by twilight than that of the other three. On July 13 at $9^h\ 15^m$ observations were made through Wratten screens, and with K_3 (yellow) all the Satellites were found to be very much brighter than when observed through a 59A (green) screen. On June $27^d\ 9^h\ 50^m$ IV. was recorded as very faint, fully two magnitudes below II. Colour, pale lilac.

Peek writes of the eclipse of III. on April 3 that it "is perhaps worthy of note as the Satellite hardly appeared to be dimmed at all at the time predicted in the N.A. The length of time it remained visible is probably not surprising as the tilt of the orbit was nearly at a maximum, and the eclipse must have been a very glancing one. I remember once, a long time ago, seeing IV., though dimmed, remain visible throughout a predicted eclipse."

APPARITION OF 1924.

Date of Opposition: 1924 June $5^d\ 13^h$.
Position of Planet: R.A. $16^h\ 55^m$ Dec. $-21°\ 56'$.
Equatorial Diameter: $45''{\cdot}8$.
Zenocentric declination of the Sun: $-2°{\cdot}7$.
Zenocentric latitude of centre of Planet's disc as seen from the Earth: $-3°{\cdot}2$.

NOTES ON THE GENERAL APPEARANCE OF THE DISC, COLOURS, &c.

No very important changes noted as compared with the Planet's appearance in 1923 and 1922.

N. Polar Regions.—Perhaps rather more heavily shaded than in previous year. The shading was observed from July onwards to extend from N. limb to N. Temperate Belt.

N.N. Temperate Belt.—Not recorded.

N. Temperate Belt.—Strong and broad. Width about 9°. Contrast appearance in 1922 and 1923 drawings with that in drawings of 1924 (Plate V., figs. 5 and 6).

N. Tropical Zone.—Perhaps wider than in previous apparitions, but otherwise no distinctive features.

N. Equatorial Belt.—Still the strongest of the belts, but rather less broad than in 1922 and 1923 mainly in consequence of the retreat southwards of its N. edge. Irregularities and interruptions at both edges, with several dark protuberances and intermediate bright spots bordering the Equatorial Zone. A few conspicuous dark spots projecting into the N. Tropical Zone.

Colour of belt, *neutral grey* or *bluish grey*; without any warm tone according to the Director's estimates.

Equatorial Zone.—Quiet and with very little detail. Colour, *white*.

S. Equatorial Belt.—Components usually well separated, but merged together in some longitudes. The belt on the whole but little disturbed, though some irregularities were observed at N. edge in March. The Director recorded a *slightly warm tone* on May 16 contrasting with the grey or bluish grey appearance of the N. Equatorial Belt. Again on Sept. 24 he remarked that it had a *slightly reddish or warm tone*.

Red Spot and Hollow.—Little change since previous apparition. The Hollow well defined though somewhat shallow. The Red Spot itself rather more conspicuous. Seen on June 23 and 25 by the Director as a faint ellipse with light centre and dusky grey border (Plate V., fig. 6). Longitude at opposition = 172° (Sys. II.).

S. Tropical Disturbance.—The *p* end in conjunction with Red Spot at beginning of apparition. Later observations showed a narrow space occupied by a small but bright white spot (Plate V., fig. 6) between *f* end of Red Spot and the dark material on the Zone. The latter apparently the actual *p* end of the Disturbance now rotating more slowly than and beginning to separate from the Red Spot. (*See* p. 19). The *f* end well defined and almost stationary in longitude at about 332° (Sys. II.). Colour of Disturbance slightly reddish.

S. Tropical Zone.—Lightly shaded near *p* shoulder of Red Spot Hollow, but otherwise featureless apart from longitude occupied by the Disturbance.

S. Temperate Belt.—Fairly strong and definite, but few details observed.

S. Temperate Zone.—*Very white* generally. On the whole the brightest region of the Disc, but a delicate shading terminating at longitude 170° ± (Sys. II.) was observed by the Director on June 23.

S.S. Temperate Belt.—Soft and rather broad.

S. Polar Regions.—Quiet. *Grey* in colour, but slightly warmer in tone than S. Polar Regions.

LATITUDES OF THE BELTS.

Measures were again made by the Director with the 8-in. refractor, and also by Peek with his 5-in. refractor at Herne. As in previous years they have been reduced to zenographical latitude.

The results taken in conjunction with those of 1922 and 1923 indicate a progressive narrowing of the N. Equatorial belt since its marked extension polewards in the first mentioned year.

LATITUDES OF THE BELTS.

Observer.	Date.	N. Temp. Belt. N. Edge. Fraction of semi-diam. from centre of disc.	N. Temp. Belt. N. Edge. Zenograph. latitude.	N. Temp. Belt. S. Edge. Fraction of semi-diam. from centre of disc.	N. Temp. Belt. S. Edge. Zenograph. latitude.	N. Equat. Belt. N. Edge. Fraction of semi-diam. from centre of disc.	N. Equat. Belt. N. Edge. Zenograph. latitude.	N. Equat. Belt. S. Edge. Fraction of semi-diam. from centre of disc.	N. Equat. Belt. S. Edge. Zenograph. latitude.	S. Equat. Belt. N. Edge. Fraction of semi-diam. from centre of disc.	S. Equat. Belt. N. Edge. Zenograph. latitude.	S. Equat. Belt. S. Edge. Fraction of semi-diam. from centre of disc.	S. Equat. Belt. S. Edge. Zenograph. latitude.	S. Temp. Belt. Centre. Fraction of semi-diam. from centre of disc.	S. Temp. Belt. Centre. Zenograph. latitude.	S.S. Temp. Belt. Centre. Fraction of semi-diam. from centre of disc.	S.S. Temp. Belt. Centre. Zenograph. latitude.
	Means		°		°				°		°		°		°		°
The Director	June 22	+·549	+31·0	+·467	+25·3	+·31[illegible]	+16·6	+·139	+5·3	−·055	−6·6	−·257	−18·5	−·418	−29·[illegible]	−·650	−45·4
	July 11	+·634	+38·2	+·465	+26·3	+·32[illegible]	+16·9	+·127	+4·7	−·048	−6·1	−·235	−17·6	−·401	−28·1	—	—
	Aug. 8	+·610	+36·6	+·479	+27·3	+·31[illegible]	+16·2	+·132	+5·1	−·064	−6·9	−·235	−17·5	−·396	−27·6	−·619	−42·9
	Means		+35·3		+26·3		+16·6		+5·0		−6·5		−17·9		−28·3		−44·2
				° +30·8				° +10·8				° −12·2					
B. M. Peek	June 20	—	—	—	—	—	—		—	—	—	—	—	−·425	−29·8	—	—
	24	—	—			+·300	+15·5	+·12[illegible]	+4·7	—	—	—	—	—	—	—	—
	25	—	—	—	—	—	—	—	—	−·029	−4·8	−·301	−21·7	—	—	—	—
	July 6	Centre	+·510	Zen. lat.	+29·9	—	—	—	—	—	—	—	—	—	—	—	—
	10	—	—	—	—	—	—	—	—	—	—	−·268	−19·7	—	—	—	—
	14	—	—	—	—	—	—	—	—	—	—	−·262	−19·2	—	—	—	—
	19	—	—	—	—	—	—	—	—	—	—	−·266	−19·5	—	—	—	—
	Means						+15·5		+4·7		−4·8		−20·0		−29·8		
								° +10·1				° −12·4					

ROTATION PERIODS.

Extremely bad meteorological conditions during the apparition combined with the great S. declination of the Planet greatly interferred with observational work by Northern Observers; and there are important regions of the disc, *e.g.*, the N. and N.N. Temperate, N. Tropical, and S. and S.S. Temperate regions, for which no data, or altogether insufficient data, are available for discussion. It is much to be regretted that systematic transit observations were not secured by observers in the Southern Hemisphere, so as to fill the gap during this period. But despite the general paucity of material the following important facts have been deduced:—

It was noted in the Report for 1923 that the Red Spot had begun to show the usual accelerated motion accompanying its conjunction with the S. Tropical Disturbance. The change of rate became accentuated during the time of the Planet's invisibility, with the result that the longitude of the spot which had been 230° at opposition in 1923 had diminished to 172° at opposition in the year under review, the mean rotation period during the interval being $9^h\ 55^m\ 34^s{\cdot}6$. It will be seen that the period during the 1924 presentation was still shorter, and it is particularly to be noted that it was less than that of the S. Tropical Disturbance for the first time since the appearance of the latter in 1901! It was interesting to observe the development of a white spot or gap between the *f* end of the Red Spot Hollow and the *p* end of the dark matter on the Zone (Plate V., fig. 6). By the opposition of 1925 this gap had widened to about 40°.

The retardation shown in 1924 by the *f* end of the Disturbance was also a notable phenomenon, but inasmuch as the whole of the Disturbance became invisible after the close of the 1925 apparition and had not reappeared down to the end of 1928 it is perhaps more suitable that a discussion of the mutual reactions between the Disturbance and the Red Spot should be deferred to a later Report of the Section's work.

Some observations were made in 1924 of a few N. Tropical Spots. They strongly suggest for one spot an abnormally short rotation period, but since they are not as numerous as one could wish and other identifications are possible the Director considers it safer to omit any deduction from them.

In column 2 of the following Tables D = dark, W = white. In column 3 the inclusion of figures in brackets indicates that the spot was not observed or did not exist at the time of opposition. The opposition longitude is inferred for the sake

of convenience from the previous or subsequent motion of the object.

N. EQUATORIAL SPOTS.

No.	Description.	Longitude at δ	Limiting Dates.	No. of Observations.	Approx. Change of Longitude in 30 days.	Rotation Period.
		ω_1 °			°	h m s
1	D - -	—	June 24–Sept. 24	4	— 14	9 50 11·2
2	W - -	(124)	June 8–Sept. 24	5	— 13	9 50 12·5
3	D - -	135	May 16–Sept. 24	6	— 14	9 50 11·2
4	W - -	162	May 16–July 19	3	— 12	9 50 13·9
5	W - -	170	May 16–July 22	3	— 12	9 50 13·9
6	D - -	(334)	June 23–Aug. 31	5	— 13	9 50 12·5
7	W - -	(342)	June 23–Aug. 31	5	— 12	9 50 13·9
8	D - -	358	June 23–Aug. 31	6	— 12	9 50 13·9

Mean Rotation Period = 9h 50m 12s·9.

RED SPOT HOLLOW.

		ω_2 °				
1	p shoulder	(156)	June 23–July 29	5	— 6	9 55 32·4
2	Centre -	(172)	June 20–Aug. 8	6	— 6·0	9 55 32·4
3	f shoulder	(188)	June 20–Aug. 8	5	— 6	9 55 32·4

Mean Rotation Period = 9h 55m 32s·4.

S. TROPICAL DISTURBANCE.

		ω_2 °				
1	p end -	(188?)	June 23–Aug. 8	4	— 5	9 55 33·8
2	f end -	333	May 16–Sept. 5	12	0	9 55 40·6
3	W at f end	340	May 16–Aug. 31	5	0	9 55 40·6

Adopted Mean Rotation Period = 9h 55m 37s·4.

SUMMARY.

Current.	1920–21.		1922.		1923.		1924.	
	Rotation Period.	No. of Objects.	Rotation Period.	No. of Objects.	Rotation Period.	No. of Objects.	Rotation Period.	No. of Objects.
	h m s		h m s		h m s		h m s	
N. Polar Spots	—	—	—	—	—	—	—	—
N.N. Temp. Spots	9 55 42·7	1	—	—		—	—	—
N. Temp. Spots.	—	—	9 55 55·7	2	—	—	—	—
N. Trop. Spots	9 55 28·5	2	9 55 20·6*	7	9 55 23·5	4	—	—
N. Equat. Spots	9 50 34·3	10	9 50 26·4	12	9 50 9·7	10	9 50 12·9	8
S. Equat. Spots	9 50 49·4	5	9 51 14·9	4	9 50 48·1	4	—	—
Spots in S.E.B.	—	—	9 55 22·4	1	—	—	—	—
Red Spot or Hollow	9 55 37·6	3	9 55 39·1	3	9 55 36·8	3	9 55 32·4	3
S. Trop. Dist.	9 55 31·7	2	9 55 31·7	2	9 55 31·7	1	9 55 37·4	3
Other S. Trop. Objects	—	—	—	—	—	—	—	—
S. Temp. Spots	9 55 16·6	3	9 55 15·0	2	9 55 14·3	4	—	—
S.S. Temp Spots	9 55 9·0	2	9 55 10·7	1	9 55 7·8	1	—	—
S. Polar Spots	—	—	—	—	—	—	—	—

* See pp. 5 and 6 (Table).

SATELLITE OBSERVATIONS.

No Satellite observations of special interest were recorded in 1924.

GENERAL REMARKS.

Taking the three apparitions discussed in this Report together the Director draws attention to the following points:—

1. The increased breadth of the N. Equatorial Belt during 1922 (after the latter part of April) and 1923, followed by a marked diminution in 1924. This is well illustrated by the drawings reproduced in the Plates taken in conjunction with those of the 1920-21 apparition.

2. The increase in the width of the N. Temperate Belt between the close of the 1923 apparition and the beginning of that of 1924 (*see* drawings in Plate V.).

3. The sudden diminution in the rotation period of N. Equatorial Spots after the apparition of 1922.

4. The continued appearance of slowly rotating spots in the S. portion of the S. Equatorial Current during 1922 and 1923.

5. The accelerated motion of the Red Spot and retarded motion of the S. Tropical Disturbance in 1924, the rotation period of the latter object being for the first time longer than that of the former.

6. The unusually quick rotation of N. Tropical Spots in 1922 and 1923.

7. The continued quick rotation of S. Temperate Spots in 1922 and 1923.

It is interesting and instructive to compare the four drawings made respectively by Du Martheray, Peek, Attkins and Bougon within three-quarters of an hour on 1922 May 23, which are reproduced in Plate I., figs. 3, 4, 5 and 6. There are, of course, certain features which all four observers show, including the very dark slowly-rotating projection from the N. edge of the S. Equatorial Belt, but there are others which some have caught and others have missed or drawn rather differently. For instance, the very bright spot at the S. edge of the S. Temperate Belt and a white area on the S. Equatorial Belt are shown on the first three of the four drawings but not on the last, whereas a very dark streak at the S. edge of the N. Equatorial Belt shown as concave to the S. on Peek's drawing is corroborated in the form given by him on Bougon's drawing, but presented differently on those of Du Martheray and Attkins'. These and other similarities and differences which might be pointed out indicate what is to be expected when drawings by different observers using different instruments and working under different conditions of seeing are compared, but at the same time it will be agreed that the drawings illustrate in a very satisfactory manner the general reliability and trustworthiness of the Section's draughtsmanship.

Published November, 1929.

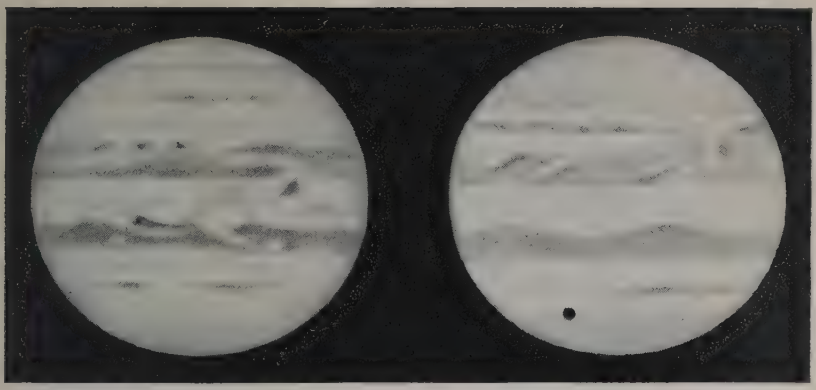

Figure 1. 1922 April 4^d 11^h 15^m
$\lambda_1 = 151^\circ$, $\lambda_2 = 65^\circ$
T. E. R. Phillips. 8-in. O.G.

Figure 2. 1922 May 5^d 8^h 30^m
$\lambda_1 = 268^\circ$, $\lambda_2 = 307^\circ$
J. Bougon. $8\frac{1}{2}$-in. spec.
Shadow of III.

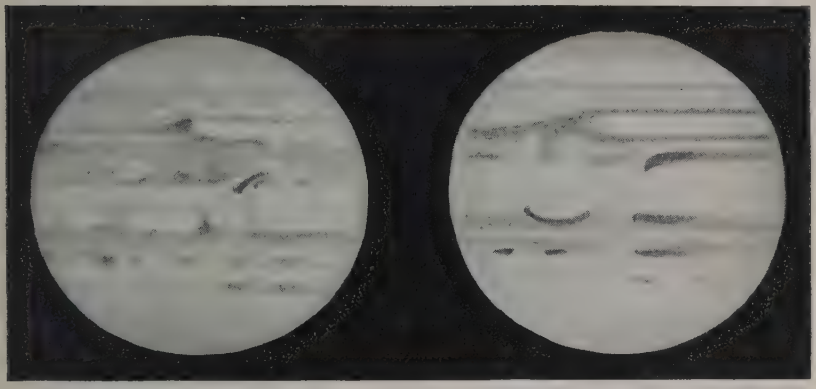

Figure 3. 1922 May 23^d 7^h 55^m
$\lambda_1 = 209^\circ$, $\lambda_2 = 110^\circ$
C. F. M. Du Martheray. $8\frac{1}{2}$-in. spec.

Figure 4. 1922 May 23^d 8^h 13^m
$\lambda_1 = 220^\circ$, $\lambda_2 = 121^\circ$
B. M. Peek. 5-in. O.G.

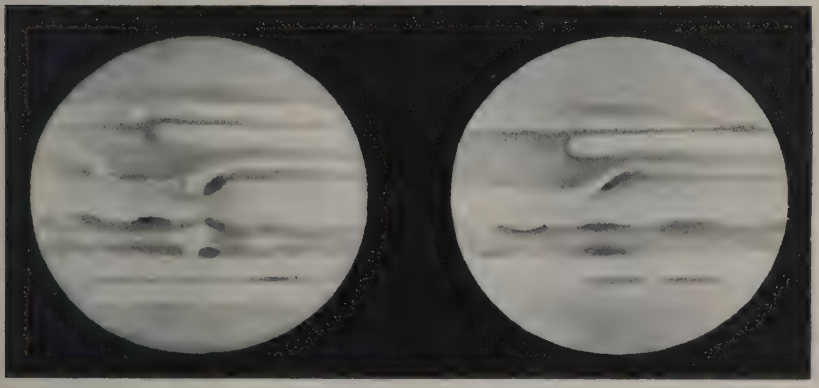

Figure 5. 1922 May 23^d 8^h 20^m
$\lambda_1 = 224^\circ$, $\lambda_2 = 125^\circ$
E. A. L. Attkins. $8\frac{1}{2}$-in. spec.

Figure 6. 1922 May 23^d 8^h 35^m
$\lambda_1 = 233^\circ$, $\lambda_2 = 134^\circ$
J. Bougon. $8\frac{1}{2}$-in. spec.

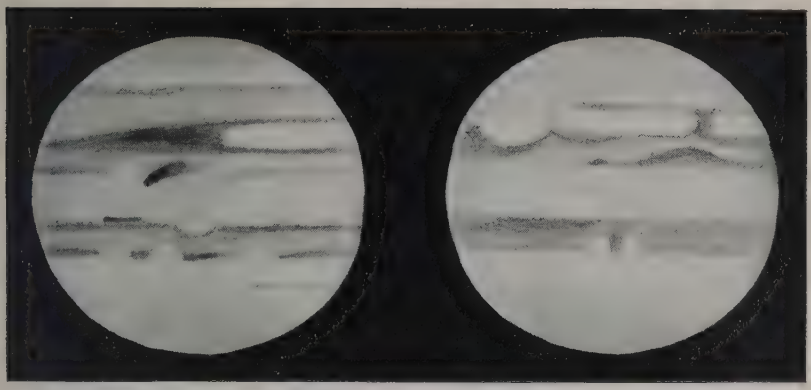

Figure 1. 1922 May $30^d\ 8^h\ 26^m$
$\lambda_1 = 253^\circ$, $\lambda_2 = 101^\circ$
B. M. Peek. 5-in. O.G.

Figure 2. 1922 June $5^d\ 5^h\ 4^m$
$\lambda_1 = 143^\circ$, $\lambda_2 = 305$
B. M. Peek. 5-in. O.G.

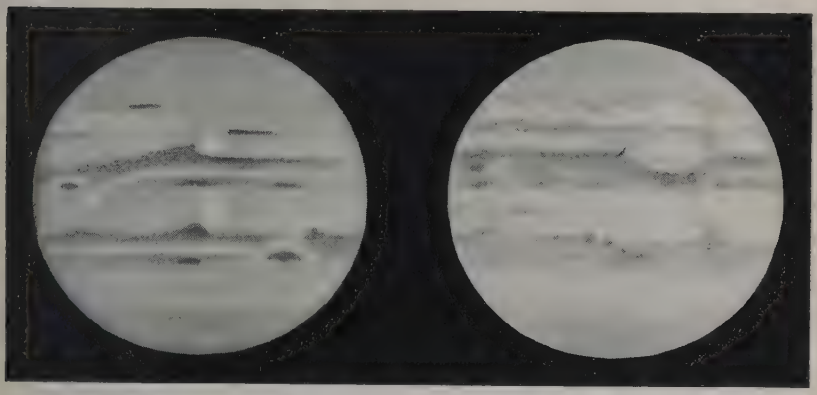

Figure 3. 1922 June $11^d\ 8^h\ 30^m$
$\lambda_1 = 349^\circ$, $\lambda_2 = 105^\circ$
E. A. L. Attkins. $8\frac{1}{2}$-in. spec.

Figure 4. 1922 June $12^d\ 8^h\ 50^m$
$\lambda_1 = 132^\circ$, $\lambda_2 = 241^\circ$
C. F. M. Du Martheray. $8\frac{1}{2}$-in. spec.

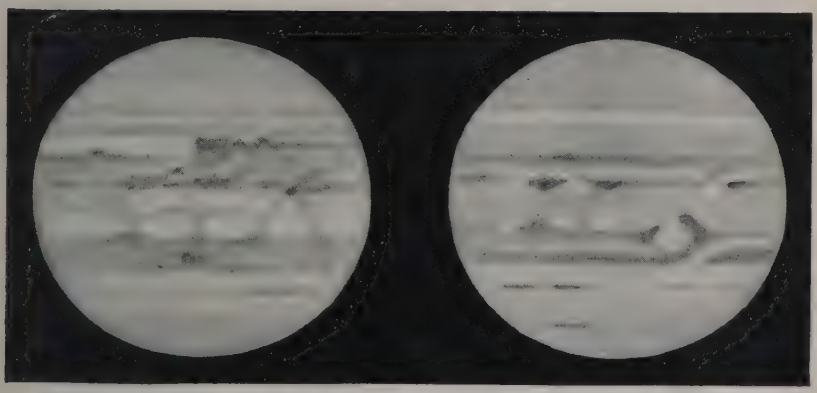

Figure 5. 1922 June $15^d\ 7^h\ 55^m$
$\lambda_1 = 239^\circ$, $\lambda_2 = 325^\circ$
C. F. M. Du Martheray. $8\frac{1}{2}$-in. spec.

Figure 6. 1922 June $15^d\ 9^h\ 15^m$
$\lambda_1 = 288^\circ$, $\lambda_2 = 13$
E. A. L. Attkins. $8\frac{1}{2}$-in. spec.

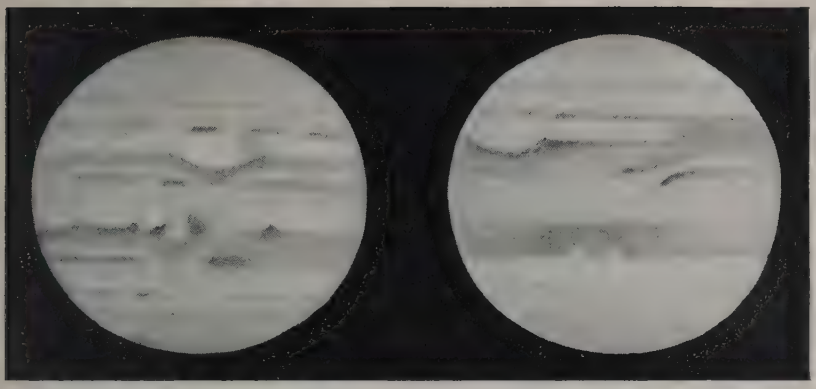

Figure 1. 1922 June 19^{d} 8^{h} 55^{m}
$\lambda_1 = 187^{\circ}$, $\lambda_2 = 242^{\circ}$
E. A. L. Attkins. 8½-in. spec.

Figure 2. 1922 June 19^{d} 10^{h} 40^{m}
$\lambda_1 = 251^{\circ}$, $\lambda_2 = 305^{\circ}$
B. M. Peek. 5-in. O.G.

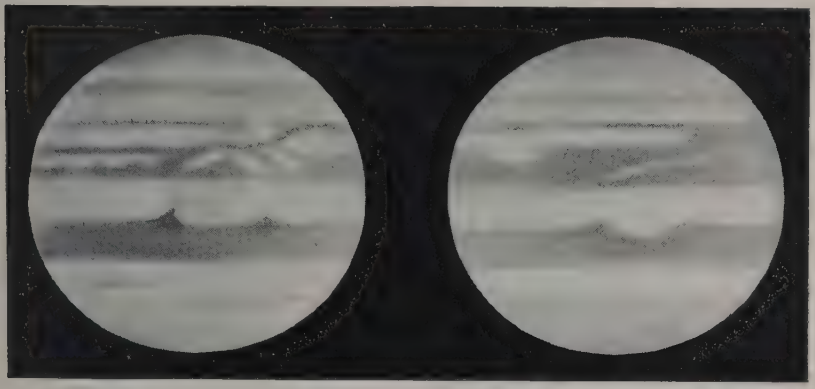

Figure 3. 1922 July 31^{d} 8^{h} 50^{m}
$\lambda_1 = 334^{\circ}$, $\lambda_2 = 63^{\circ}$
P. M. Ryves. 10¼-in. spec.

Figure 4. 1922 August 28^{d} 8^{h} 15^{m}
$\lambda_1 = 42^{\circ}$, $\lambda_2 = 283$
P. M. Ryves. 10¼-in. spec.

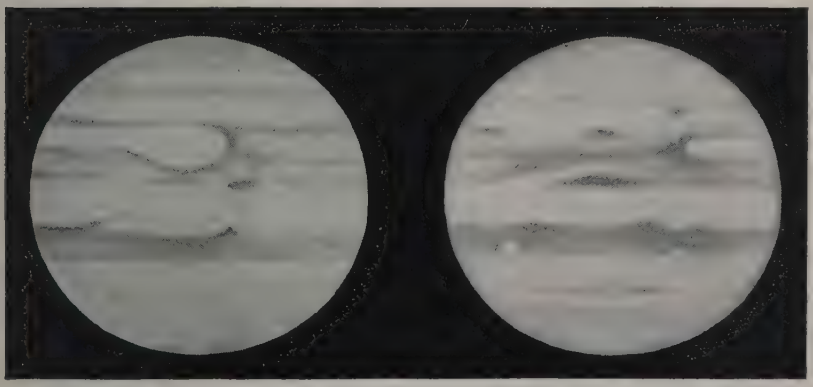

Figure 5. 1923 April 14^{d} 11^{h} 40^{m}
$\lambda_2 = 306^{\circ}$, $\lambda_2 = 239^{\circ}$
B. M. Peek. 12½-in. spec.

Figure 6. 1923 April 27^{d} 11^{h} 0^{m}
$\lambda_1 = 176^{\circ}$, $\lambda_2 = 10^{\circ}$
T. E. R. Phillips. 8-in. O.G.

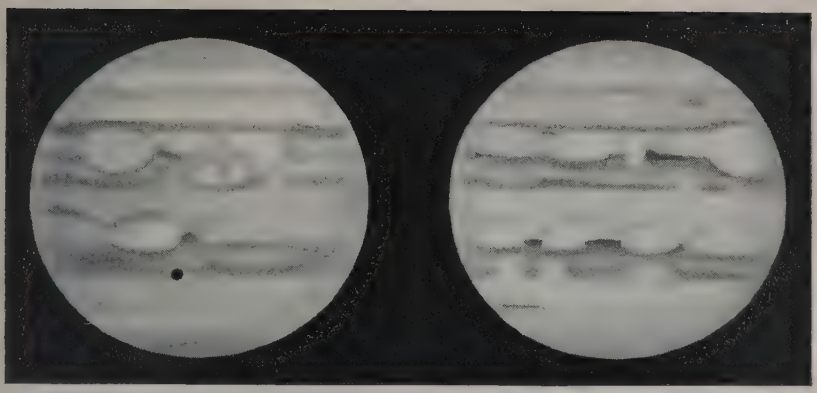

Figure 1. 1923 May 1^{d} 11^{h} 28^{m}
$\lambda_1 = 105^{\circ}$, $\lambda_2 = 269^{\circ}$
B. M. Peek. 12½-in. spec.
Shadow of Sat. I. Closely followed by the satellite in transit.

Figure 2. 1923 May 3^{d} 10^{h} 45^{m}
$\lambda_1 = 35^{\circ}$, $\lambda_2 = 183^{\circ}$
B. M. Peek. 12½-in. spec.

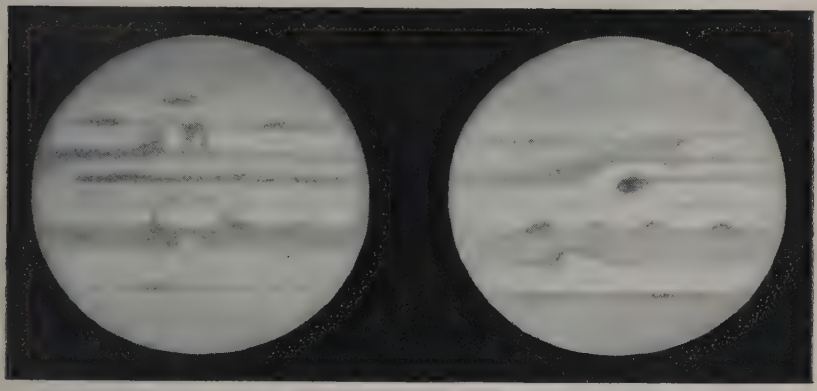

Figure 3. 1923 May 4^{d} 12^{h} 30^{m}
$\lambda_1 = 257^{\circ}$, $\lambda_2 = 37^{\circ}$
T. E. R. Phillips. 8-in. O.G.

Figure 4. 1923 May 23^{d} 11^{d} 2^{m}
$\lambda_1 = 326^{\circ}$, $\lambda_2 = 321$
F. Sargent. 10-in. spec.

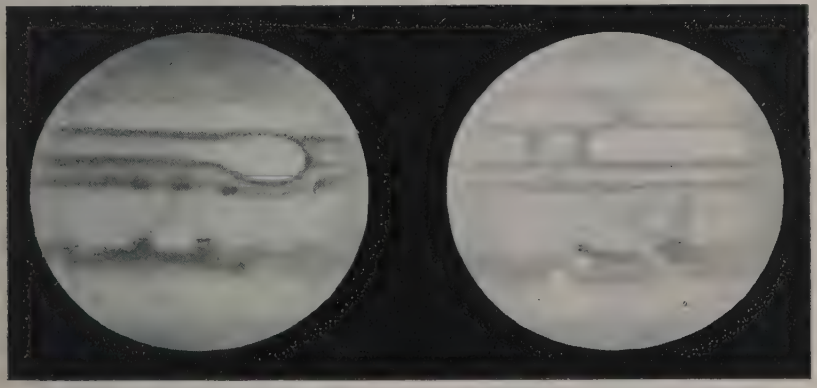

Figure 5. 1923 May 30^{d} 8^{h} 50^{m}
$\lambda_1 = 271^{\circ}$, $\lambda_2 = 214^{\circ}$
B. M. Peek. 12½-in. spec.

Figure 6. 1923 June 7^{d} 10^{h} 30^{m}
$\lambda_1 = 155^{\circ}$, $\lambda_2 = 37$
B. M. Peek. 12½-in. spec.

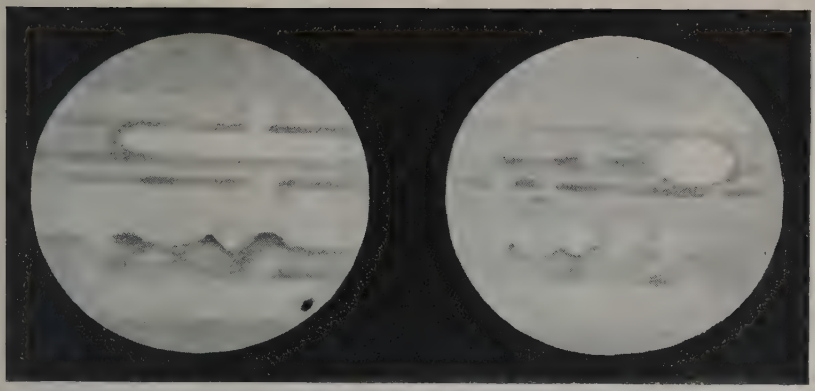

Figure 1. 1923 June 10^{d} 8^{h} 30^{m}
$\lambda_1 = 196^{\circ}$, $\lambda_2 = 55^{\circ}$
B. M. Peek. 12½-in. spec.
Shadow of II.

Figure 2. 1923 June 11^{d} 8^{h} 30^{m}
$\lambda_1 = 354^{\circ}$, $\lambda_2 = 205$
B. M. Peek. 12½-in. spec.

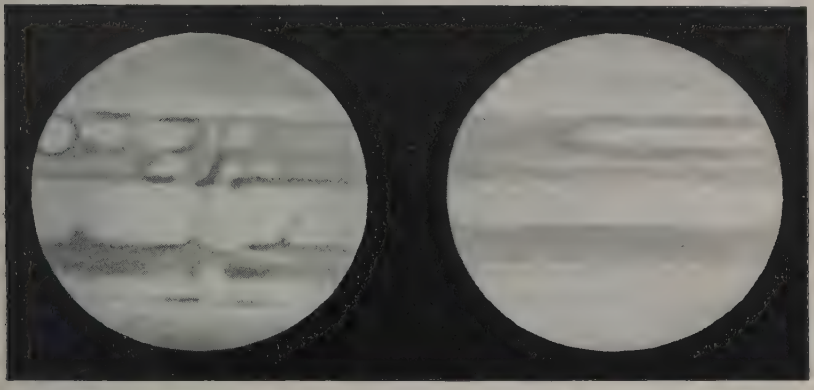

Figure 3. 1923 June 14^{d} 8^{h} 36^{m}
$\lambda_1 = 111^{\circ}$, $\lambda_2 = 300^{\circ}$
B. M. Peek. 12½-in. spec.

Figure 4. 1923 July 11^{d} 8^{h} 45^{m}
$\lambda_1 = 59^{\circ}$, $\lambda_2 = 41^{\circ}$
G. H. Lepper. 6½-in. spec.

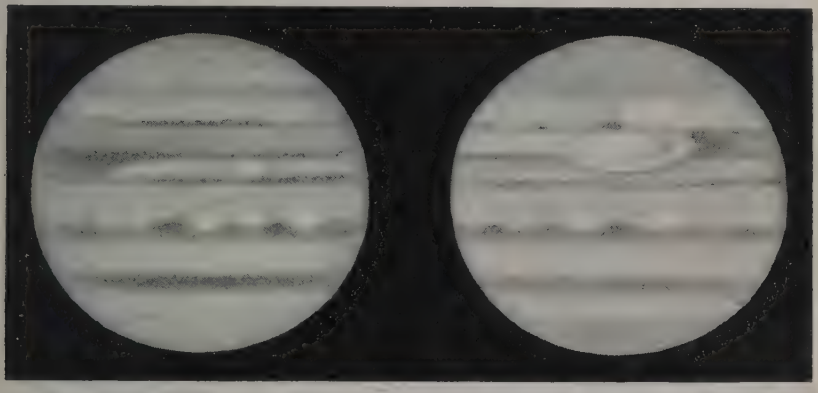

Figure 5. 1924 May 16^{d} 12^{h} 20^{m}
$\lambda_1 = 144^{\circ}$, $\lambda_2 = 280$
T. E. R. Phillips. 8-in. O.G.

Figure 6. 1924 June 23^{d} 10^{h} 30^{m}
$\lambda_1 = 322^{\circ}$, $\lambda_2 = 169$
T. E. R. Phillips. 8-in. spec.

Memoirs

OF THE

British Astronomical Association.

VOL. XXIX.—PART II.

SIXTEENTH REPORT OF THE SECTION

FOR THE OBSERVATION OF

THE SUN.

1926 and 1927.

Director—A. M. Newbegin, F.R.A.S.

LONDON:
PRINTED AND PUBLISHED FOR THE ASSOCIATION
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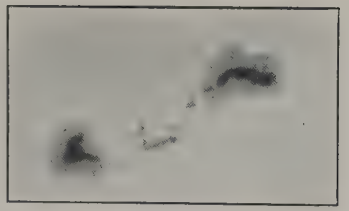
Published June 20, 1930.

Sunspots of 1926. September 19.

Original Photograph.



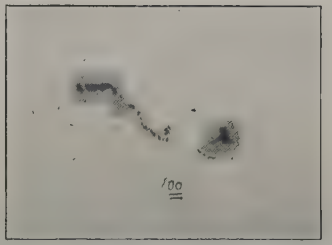
Enlargement.

By F. S. Sellers, F.R.A.S.

Longitude 137°. Latitude N. 24°.

Drawing.

By Miss C. O. Stevens.



Drawing.

By L. Woolven.

SECTION FOR THE OBSERVATION

OF

THE SUN.

DIRECTOR.—A. M. NEWBEGIN, F.R.A.S.

SIXTEENTH REPORT OF THE SECTION, 1926 and 1927.

It is a great satisfaction to record some very persistent work by the members of this Section during the two years covered by this Report, and it is particularly pleasing to welcome some new workers, one of whom is devoting his time to the observation of prominences, in the person of Mr. A. F. Bennett.

Mr. W. A. Parr is also well equipped for observations of the limb, and the results in the future should furnish more complete records of chromospheric activity than has been the case in past years.

Most of the work submitted consists of drawings of the sun-spots on a scale of 6 inches to the solar diameter, a very large number being supplied by Mr. Leslie Woolven; but some very beautiful examples on a scale of 24 inches have been received from Mr. F. M. Holborn.

Mr. F. J. Sellers has supplied a few photographs on a scale of 2·5 inches which show some very good detail, and the Director wishes to say here that he would welcome some more work done by photography. Without in any way belittling observations made with the eye, which often secures changes occurring in the course of a few minutes and which the camera is almost powerless to deal with, the latter depicts far more detail than can ever be portrayed with a pencil, no matter how good the definition or how skilful the draughtsman may be.

The photographs referred to have been compared with a drawing made on the same day, and it must be confessed the former give a much truer representation of the large group of sun-spots crossing the disc at the time, even though they are much over-exposed. It is the Director's considered opinion, after some two or three years' experience of drawing sun-spots on a scale of 6 inches, that it is impossible to delineate the details seen in the eye-piece of the telescope, especially in the case of small spots.

To illustrate this point the photograph has been reproduced side by side with the drawing, both being the original size. Another photograph of the same group is also reproduced on a larger scale to show how much more the camera is to be relied upon for accurate details. (*See* Frontispiece.)

The remedy for this state of affairs is not easy to apply, as it is expensive to photograph the sun continuously, but it is not really necessary to use a photographic plate at all. Some years ago, at Cambridge, photographs of the Sun were taken upon a gaslight paper which was inserted in the dark slide in place of the usual plate and exposed. The result was that a vast amount of detail, especially among the faculæ, was obtained. Such a method, if adopted, would simplify dark-room operations, as only one development would be required, and for all practical purposes one could soon learn to interpret the results from a negative image.

To return to the drawing of sun-spots, it seems the most profitable course to pursue is to concentrate on large-scale drawings with a view to recording the changes taking place in the umbræ and penumbral filaments, about which we know relatively little. Changes are constantly going on which obviously the camera cannot record, and it is here that the Section can do really useful work.

A full report of the Section for 1925 appeared in the *Journal*, but for the sake of continuity a Summary for that year is given here. (*See* Journal, B.A.A., Vol. 37, p. 24.)

Summary of Solar Activity 1925 to 1927.

1925.

Sun-spots.—Activity was somewhat spasmodic, especially in the first half of the year. In the latter half the increase in both numbers and areas became conspicuous, and no fewer than seven groups of sun-spots were visible to the naked-eye. These groups affected the Sun's spotted area to such an extent that the Greenwich records showed for all spots on the disc an area of over 5,000 millionths of the Sun's hemisphere, "an amount rarely equalled before in the Greenwich records even at maximum phase." The average latitude of the spots for the year was about 20°, and indicated that the cycle had advanced about half way from minimum to maximum.

Prominences.—The mean daily number of prominences from the Sutton observations was 12·21. Kodaikanal averaged 17·20 from spectroheliographic results.

The preponderance of activity was in the northern hemisphere and on the east limb. There were maxima zones at about 60° in both hemispheres. Metallic prominences decidedly favoured the northern hemisphere and the east limb, and it is interesting to note the increase in these eruptions roughly coincided with the remarkable increase in the number of spots observed in the last quarter of the year.

1926.

Sun-spots.—The progress of the cycle towards maximum was maintained at a fairly uniform rate, but there were two comparatively quiet periods in April and July; and according to Prof. Moye there were ten days without spots in the latter month.

The Greenwich records show that the mean daily spotted area was about 50 per cent. in excess of the previous year.

Twelve naked-eye groups of spots were seen, and one in January was the largest ever photographed at Greenwich.

From details supplied by Mr. H. W. Newton, on January 20, the area of this spot was 4,000 millions of square miles: length and breadth about 70,000 miles. Its solar latitude was 21° north. A large tract of bright faculæ following (about the same size as the spot) lasted, slowly diminishing, for nearly six months after the spot itself had disappeared. A magnetic storm lasting eleven hours commenced on January 26, when the spot was a little over two days past the Sun's central meridian.

In the latter half of the year, the naked-eye groups of spots were seen over a wide range of latitude, and Newton says, "this may be taken as an indication that the Sun is nearing maximum phase of activity for the present cycle." The average latitude for all spots was about 17°.

Prominences.—The Sutton observations yielded a mean daily number of 15·64, those from Kodaikanal 18·15.

The eastern hemisphere showed an excess over the western in numbers, but the latter was more prolific in areas.

The maxima of prominences in high latitudes advanced towards the poles about 10°.

Metallic activity was much greater than in the previous year, and was of greater intensity in that more lines were affected.

It is interesting to note that, following the largest sun-spot ever photographed, Dr. T. Royds at Kodaikanal on February 21 photographed the largest dark marking. This dark marking was of long duration, being first seen on 1925 December 18, and last seen on 1926 April 16.

1927.

Sun-spots.—To summarise the activity of the Sun for this year offers some difficulties. The preceding years of the present cycle seemed to indicate the maximum would be a high one and that it would occur at the end of 1927 or early in 1928. Observations have revealed the fact that a decrease in the number of spots recorded has been going on since May, and the figures are such as to suggest the maximum is past. Mr. H. W. Newton points out, however, that we must watch the progress of events during the next few months before forming a definite opinion, as it is possible the history of 1905 and 1907, when we had a double maximum, may repeat itself. Newton remarks, "if so, it will please those who are looking for a 23-year period in solar changes, this being the magnetic cycle of sun-spots."

The number of spots recorded was in excess of 1926, and the increase was almost entirely in the southern hemisphere.

The average latitude was 15°·5, but the Mount Wilson records show that in November and December the mean latitude was 12°·3 for the northern hemisphere, and 13°·2 in the southern. "These are well below the average latitudes at the last few maxima, and offer further evidence that the maximum activity is now past." (*See* Publications, A.S.P., Vol. 40, p. 49.)

Prominences.—The observations at Sutton being necessarily terminated in July, no reliable deduction for the whole year is possible. The mean daily number of prominences recorded at Kodaikanal was 19·55, being a slight increase on 1926. The maxima of prominences in high latitudes advanced about 10° towards the poles in the first half of the year, and then the activity received a check so far as areas were concerned, although it was still evident in numbers.

A remarkable prominence was observed at Kodaikanal on 1927 March 14 which attained a height of 420 seconds of arc in half an hour. The H*α* line was visually observed displaced 20 A towards the red and 5 A towards the violet. (*See* Monthly Notices, R.A.S., Vol. 88, p. 300.)

Observations of Sun-spots.

By PROF. MARCEL MOYE, D.-EN-D.

These records have all been made with a 2-inch refractor, and are on exactly the same lines as those of former years.

Month.	Days of Observation.	Days without Spots.	Number of		Days of Observation.	Days without Spots.	Number of	
			Groups.	Spots.			Groups.	Spots.
	1926.				1927.			
Jan.	31	0	92	390	31	0	142	507
Feb.	28	0	118	334	28	0	130	400
Mar.	30	0	90	376	30	2	115	301
Apr.	28	4	64	112	30	0	109	475
May.	28	1	81	266	31	0	116	372
June	30	0	117	350	30	0	84	318
July	31	10	67	267	31	0	80	256
Aug.	31	0	82	342	31	0	78	325
Sep.	30	0	90	308	28	0	92	331
Oct.	27	0	102	359	28	0	88	356
Nov.	30	0	97	295	25	0	79	398
Dec.	27	0	115	448	24	0	55	238
Total	351	15	1,115	3,847	347	2	1,168	4,287

The percentage of days with no spots for 1926 was 4·27 and for 1927 it was 0·57.

The mean daily number works out at 10·9 for 1926 and 12·35 for 1927.

Mr. H. W. Newton's Report for 1926.

The following table gives the heliographic positions of the chief groups, the average latitude working out at about 17° for all the spots seen during the year. Judging from these figures the highest peak of the present cycle will not be reached before the end of 1927:—

Date of C.M. Passage.	Heliographic		Maximum Area.	Remarks.
	Longitude.	Latitude.		
	°	°		
1926. Jan. 22	65	S. 21	1,000	Regular spot: return of Dec. group
24	35	N. 21	3,300	Great composite spot: return of Dec. group
Feb. 15	113	S. 18	800	Abnormally long stream
19	59	S. 21	600	Regular spot: return of Jan. 22
Mar. 3	254	S. 26	1,600	Composite spot
May 13	35	S. 20	950	Normal type
June 22	235	N. 25	700	Regular spot and small spots following
29	137	N. 21	800	Large spot and stream
July 30	92	S. 10	1,800	Stream of normal type
Aug. 16	225	S. 18	750	Stream of approximately normal type
Sep. 19	137	N. 24	1,850	Two principal large spots
Dec. 15	60	N. 7	1,000	Stream

(Areas are corrected for foreshortening and expressed in millionths of the Sun's visible hemisphere.)

The second spot of January is the largest ever photographed at Greenwich. It was associated with two magnetic storms commencing on January 26 and February 23 respectively. Besides these twelve groups of spots, each one visible to the naked-eye, there were some half-dozen groups only slightly below this limit. A feature of the spots during the latter half of the year is the appearance of two large ones (in July and December) and other smaller ones in equatorial regions.

This may be taken as an indication that the Sun has now entered its maximum phase.

Mr. H. W. Newton's Report for 1927.

Until the final figures are published from Greenwich and Zurich, it may be said the sun-spot activity for 1927 is practically the same as for 1926. This means there was a distinct halt during 1927 in the marked increase of spots since the last minimum.

The following table gives the heliographic positions of the spots which were visible to the naked-eye during the year. Other such spots may have been noted by keen-sighted observers, but

those enumerated in the table were seen without difficulty for at least two or three days.

Date of C.M. Passage.	Heliographic.		Approximate.
	Longitude.	Latitude.	Maximum Area.
	°	°	
Jan. 1·3	203	S. 7	800
8·5	109	S. 13	900
19·3	330	N. 24	900
May 11·7	284	N. 17	870
June 8·0	283	N. 16	1,500
July 5·4	280	N. 15	680
27·8	344	S. 8	530
Aug. 14·2	113	S. 10	1,350
Sept. 14·3	63	S. 19	1,260
Nov. 10·4	29	S. 9	1,250

(Areas are corrected for foreshortening and are expressed in millionths of the Sun's visible hemisphere.)

A short description of the spots was given at the January meeting. (*See* Journal B.A.A., Vol. 38, p. 114.)

Points of interest were—the largest of the above groups was rather smaller than the fourth of a similar list for 1926. The groups of May, June and July are returns, and at the time of the total solar eclipse of June 29 the group was at the Sun's east limb at P.A. 75° from the north end of the Sun's axis. The group of August was a complex spot which was the place of origin of an unusual display of prominences observed at Mt. Wilson on August 19. The group of November was seen on the disc together with Mercury on November 10.

Mr. F. M. Holborn's Report for 1926.

Instruments.—3¼-inch Wray altazimuth refractor without slow motions; 44·5 inch focal length. Occasionally an 8½-inch Calver reflector equatorially mounted was used.

Methods of Observation.—Direct view: projection method not used. Until March 6 two wires at right angles in the field of a ×30 eye-piece were used for recording positions of spot features on the 6-inch drawings. After the date given an eye-piece micrometer ruled in squares in the stop of a ×36 eye-piece was used. By this means, after some practice, it was found possible to estimate the latitude and longitude of the spots, using the Stonyhurst Discs, with an error, as a rule, of not more than one or two degrees. The method is laborious with an altazimuth without slow motions, involving, as it does, frequent rotations of the eye-piece.

The number of days of observation was 253.

The number of spot features seen was 271.

(The term " spot feature " includes the case of a solitary spot, a group or a stream, and indicates a disturbance separate, in the opinion of the observer at the time, from any other disturbance showing spots on the disc at the time.) Spot features seen with the naked-eye numbered 26.

On October 10 three groups were visible at once to the naked-eye in the northern hemisphere.

A marked dearth of spots occurred from July 7 to 25.

The minimum number of spot features seen in any month was 15 in February and the maximum number was 29 in May.

No analysis has yet been made to determine the exact incidence of spot features in the various latitudes in either hemisphere, but a latitude of 20° would seem to be the most usual with a tendency to lower latitudes towards the end of the year. Lower latitudes than 10° were infrequent, though one very small spot in north lat. 2° was seen on December 18. Curiously the spot feature of highest latitude recorded was visible at north lat. 32° at the same time.

Spiral Structures.—Under good conditions of visibility and with high powers the majority of the spots visible to the naked-eye exhibited in some part a spiral arrangement of penumbral filaments and frequently of the umbræ. The larger umbræ of the bigger spots have always exhibited more than one darker nucleus when seen with high magnification.

Notes on Some of the Spot Features.

Group 2.—Long. 287°, lat. S. 17°.

On January 4 it was seen as a large group of small dots and smudges. By January 6 it had become an unusual formation of three fairly big spots in line, visible to the naked-eye as a short continuous line. The leader grew quickly smaller and increased its distance from the middle and trailer spots until it passed over the west limb on January 12.

Group 11.—Long. 65°, lat. S. 21°.

This spot appeared smaller than it was on account of the presence in the northern hemisphere of the gigantic No. 13.

Accurate records were not made in 1925, but it would appear that this group is the remains of a pair of spots which was seen in December. Unlike No. 13 it survived two more rotations in not greatly diminished form. Yet again it appeared, this time divided by a bridge of photospheric matter and still a fair size, though not of naked-eye visibility as in its first two rotations. On this last return it diminished rapidly as it approached the C.M. on April 15, and was last seen on April 18. If the somewhat rough position taken may be trusted, its backward drift in longitude would appear to have been irregular; indeed from February 19 to March 18 no drift was noticed.

Group 13.—Long. 35°, lat. N. 21°.

This was the largest spot feature of the year and was a return of the group seen on the east limb on 1925 December 22. On January 18 its unusual size rendered it visible to the naked-eye as a notch on the limb. The drawings give a better idea of its appearance than a verbal description, but on January 24, when it crossed the C.M., it was visible to the naked-eye as an oval spot with a prolongation in a *p* direction,

the smaller leader being joined to the huge trailer. The whole occupied about one-sixth of the Sun's diameter. Spiral structure in the main spot was very clearly seen with high powers on the 21st. In the subsequent rotation in February it had disintegrated into numerous small patches, and some small spots were still on the site of this disturbance in March.

Group 34.—Long. 254°, lat. S. 26°.

This was an easy naked-eye feature from March 1 to 6, and it was remarkable for the pronounced spiral structure in the main spot on March 1 and 2, which spot subsequently elongated in a striking manner and broke up.

Group 126.—Long. 187°, lat. No. 20°.

An instance of a large group with a short life. First seen on June 28 as two small spots, on July 1 it was a large bi-polar group nearing the west limb. A striking display was expected on its return, but only one small spot in brilliant faculæ appeared, and it was last seen on July 18.

Group 151.—Long. 92°, lat. S. 18°.

A very fine bi-polar pair, apparently fully developed on the invisible disc. The leader was first seen on July 23 at $17^h\ 15^m$. It was not seen at $8^h\ 30^m$ of the same day. Of somewhat the usual type with large regular leader showing spiral structure, and still larger irregular trailer, it was a naked-eye group for most of its passage, extending for some 7° of latitude and 15° of longitude. The trailer and intermediate stream soon diminished, but the leader in reduced form survived two more rotations, exhibiting a forward drift in longitude of 5° in 27 days on each rotation, which is about 2° in excess of that given for spots of that latitude in the B.A.A. Handbook.

Group 184.—Long. 137°, lat. N. 24°.

Formed on the invisible disc and was first seen on the east limb on September 13. A fine bi-polar pair, the leader and trailer were separately visible to the naked-eye when only three days from the limb. Detail drawings were made on 5 days, some of which show spiral structure in both spots.

Great elongation of the leader took place after crossing the C.M., by its amalgamation with the small umbral and penumbral masses between it and the trailer. The leader and trailer also drifted further apart. The dark nuclei in the main umbræ were conspicuous throughout. It survived to a second rotation, and although much smaller, was just visible to the naked-eye. At its greatest phase the group covered some 5° of latitude and 20° of longitude.

Group 257.—Long. 318°, lat. N. 32°.

A spot of only moderate size: it was interesting for its persistent nature and its high latitude. It was first seen on December 18 as a single spot, and subsequently with one or two small attendants. On the two following rotations in 1927 it appeared, while on yet two more the trailer part of a large

group occupied the site. It exhibited a backward drift in longitude for each rotation relative to the Earth of exactly 20°, which is considerably in excess of that given in the tables in the B.A.A. Handbook.

Mr. F. M. Holborn's Report, 1927.

The same instrument was used as in 1926, but after the end of April the $3\frac{1}{4}$-inch refractor was mounted as an equatorial and driven by hand. This instrument was used on almost every occasion, except when away from home and occasionally when the Sun, especially in winter, was out of reach of the equatorial. A poor S.W. view at the usual site causes some days to pass without observation when the Sun only shines late in the day.

A search for spot features is usually made with a power of $\times 60$, and their positions and general appearance recorded on a 6-inch disc ruled in squares in such a manner as to correspond with an eye-piece micrometer ruled in squares placed in the stop of a Huyghenian eye-piece giving a power of $\times 40$. The projection method has not been used.

The Stonyhurst Sun Discs have been used for reduction of positions to solar latitude and longitude, which, by the method outlined above, can with care and time be obtained correct to approximately one degree for spots not too near the limb when the equatorial is in use. With the altazimuth the chances of error are perhaps not quite doubled, provided the time given to the observation is doubled.

Large scale drawings are generally made, using a power of $\times 90$, and occasionally in very steady air of $\times 139$.

Accuracy of outline in large scale drawings is verified by causing the image seen by the eye at the telescope to coincide with, or lie closely beside, the outline drawn and viewed with the other eye, when discrepancies can be seen and corrected.

The Sun was occasionally observed with an $8\frac{1}{2}$-inch equatorial reflector stopped down to about half its aperture or less, but though on some occasions of very steady air more detail was seen with the reflector, on the whole the refractor was more effective.

Naked-eye observations were made whenever time permitted.

Number of Spot Features.

Counting each appearance of a recurrent group as if it were a new feature, 256 were observed in 1927 as against 271 in 1926. The writer is of opinion that 1927 also provided fewer large spots than the previous year. January had more large spots than any other month. Out of 21 observing days in January, 13 provided the sight of naked-eye spots, of which in that month there were 6. In September, October and December no spot was seen with the naked-eye, but it should be mentioned that part of September and October was not available for observations owing to incapacitation, while the sky in December was so bad that records were only made on ten days. In January

also the greatest number of recurrent spots was recorded, of which there were nine.

In May the greatest number of new outbreaks was seen, of which there were twenty-eight (mostly small), the daily average of such for the month being 0·9, even though no new features were seen in the last six days. March was next with an average per day of new spot features of 0·8, but had only one really large one, while from the 25th to the 28th there were only a few quite small ones. August and December had the lowest daily average of 0·4 new features, but as only ten observations were made in the latter month some may have been missed, and August was probably the month with fewest new features.

February had the highest average daily spot count of 7·1 and December was lowest with 2·8, and August next lowest with 3·3. (On February 5 eleven spot features were counted on the disc.) Undoubtedly the last seven months showed a decline compared with the first five, giving only 103 new spot features as against 114.

Spot Latitudes.

Spot latitudes became lower throughout the year, and in the whole of November and December only two spots were observed as far as 20° from the Equator. The incidence in the northern hemisphere slightly exceeded that in the southern in March, but in every other month southern spots predominated in numbers. For new outbreaks for the year the numbers were 91 north and 126 south, and for recurrent spots the numbers were 14 north and 25 south. On no occasion out of 212 days' observations was the Sun found to be entirely free of spots.

Large Scale Drawings.

In addition to 203 6-inch whole disc drawings, 26 on a scale of 24 inches to the solar diameter were made, chiefly with the object of recording the mode of development of spots from their very first appearance. It is apparent that without ample leisure, not many such complete records can be obtained. Many small spot features were drawn on a scale of 24 inches on their first appearance, but most failed to develop and disappointment was the rule.

In general it would seem that the first appearance is that of small umbræ around and between which patches of penumbræ appear, often in the form of long filaments, curved or straight. Darkening occurs in them and more umbræ appear and coalesce, the first umbræ possibly remaining as the intensely dark nuclei always found in any large umbræ. A vortical motion is frequently seen, and a spiral arrangement of some part at least of the umbra or penumbra or both can be observed with high powers during steady conditions of the air in most large spots in their early stages. Spots on the down grade of activity would appear to lose size both in umbra and penumbra and to become more regular in outline. The umbra is practically always the last to go.

Birth and Death Incidence.

A certain amount of work has been done on the investigation of spots on the visible and invisible discs respectively, Mrs. Maunder having found that more spots of all lengths of life came over the eastern limb from the invisible disc than were born on the visible disc. She also analysed the history of spots living for eight days (observed) or more, and found that more of these came over the eastern limb and died on the visible disc after passing the central meridian than were born on the visible disc and passed over the western limb to the invisible disc.

Her findings were based on the photographs taken at or for the Royal Observatory, Greenwich, over a large number of years. These, doubtless, have the advantage of number and continuity, but the disadvantage of failing, in some cases, to show small spots which are readily seen at the eye-piece.

The writer has been curious to see if visual observations would support these findings, for which Mrs. Maunder, no more than anyone else, can find an obvious explanation. He has laboured under the disadvantages of limited leisure and of working single-handed (with the exception of 13 drawings kindly supplied by Mr. Woolven). With this help there are 225 days of observation upon which to base provisional conclusions. Two hundred and fifty-three observations were made in 1926, but are not yet tabulated. The following remarks, therefore, apply only to spot features of the writer's report for 1927.

As regards spots of all lengths of life (the observations of which are tabulated in the monthly columns enclosed with this report) 132 were born on the visible disc (63 east and 46 west of the C.M., 23 being born on the C.M. or on an unascertained side of it) as against 57 born on the invisible disc. In the case of 28, owing to gaps in the observations, the place of birth has not been ascertained and is marked with a query. So far this would seem to be the reverse of what Mrs. Maunder found in the years covered by the Greenwich photographs.

The death of spots of all lengths of life has not been worked out, it being a matter of considerable labour, but it has been begun, and it is hoped it will eventually be completed.

As regards the so-called eight-day spots, *i.e.*, those having an observed life of eight days or more, the writer has not felt that results based upon these are likely to provide much more definite conclusions than those based upon all spots for determining any tendency for spots to be born or die on any particular part of the Sun relative to the Earth's position. A spot observed for eight days, may, for instance, if born on the invisible disc, have an actual life of 22 days, 14 of which are unobserved before it comes into view on the eastern limb; or again, a spot may be born and die on the visible disc and rank as an eight-day spot, but if this happens on the invisible disc it is not recorded as a spot at all; or again, if it is born on the invisible disc eight days before it comes into view on the eastern limb on to the visible disc where it survives for seven

days more, it is not counted as an eight-day spot, although it has lived for 15 days; or yet again, a spot born on the visible disc one day only before passing out of sight over the western limb may persist for more than seven days on the invisible disc cannot figure in results based on an eight-day spot record.

For so-called eight-day spots, therefore, the discrepancy between the ascertained and the unascertained portions of a spot's life are too great. The writer has accordingly taken for a preliminary survey only really long-lived spots, *i.e.*, those which have survived one or more rotations. The greater part of the lives of such spots can then be accounted for, and little is left to estimation.

Thirty-one recurrent spots were observed in 1927, accounting for 39 re-appearances, owing to some surviving more than one rotation. The following table gives the results:—

Born on Visible Disc.		Born on Invisible Disc.	Birth not known.
East of C.M.	West of C.M.		
10	9	10	2
Died on Visible Disc.		**Died on Invisible Disc.**	**Death not known.**
East of C.M.	West of C.M.		
2	10	16	3

These results again disagree directly with Mrs. Maunder's in spite of any bias the writer had in placing the birth or death of a spot being in favour of her findings.

It is hoped in due course to apply a similar analysis to 1926 and 1928 observations, and so obtain results based on three consecutive years which would carry much more weight than those based on one year only.

Interesting Spot Features.

Group in Longitude 326°, *Latitude N.* 22°.

This was first seen as No. 264 of 1926 in December not far from the *Np* limb. It re-appeared on January 13 on the *Nf* limb as a large irregular spot with outliers, and if appearance and fairly careful drawings may be trusted, showed considerable bodily rotation in a clockwise direction. Certainly the big spot under high powers could be seen to have spiral structures in a marked degree.

Group in Longitude 260°, *Latitude N.* 30°.

An extreme instance of a bi-polar group with a regular leader of moderate dimensions and an enormous diffuse trailer which failed to consolidate. Noteworthy also for its high latitude, the highest part reaching to N. 35°. First seen on March 15 almost on the site of a spot which had survived three rotations, it must have appeared on the east limb on the 13th, crossing the C.M.

between 19th and 20th and covering some 18° of longitude. Becoming overlaid with photospheric matter, it was nearing the western limb on March 25. The leader was seen again on the eastern limb on April 10 at $14^h\ 0^m$, much reduced in size and the trailer followed as a scattered group, much smaller than on the previous rotation. The group broke up rapidly and just failed to reach the western limb. It exhibited a backward drift in longitude of about 18° in 27 days. The leader on its first appearance showed traces of spiral structures, indicating a vortex.

Group in Longitude 284°, *Latitude N.* 17°.

A feature of very rapid growth; it was not seen on May 9 at 12.15, but on the 11th at 8.15 it was a bi-polar looking stream, visible to the naked-eye as an elongated spot and preceded a small group. It crossed the C.M. on the 11th, still increasing in size, and on the 14th the leader and trailer had grown until they almost touched, which they actually seemed to do on the 17th when nearing the west limb. Re-appearance on the east limb was on June 2, as one spot with a narrow bridge. It gradually lengthened, and on the 9th was seen as three fair-sized spots joined and again visible to the naked-eye. It turned up again on the day of the total eclipse (June 29) somewhat diminished, as a spot of moderate size with a smaller one to to the north and some quite small trailers. It increased its size and became yet again on this, its third rotation, visible to the naked-eye on July 4, and finally disappeared over the west limb on July 11.

Group in Longitude 113°, *Latitude S.* 10°.

Another instance of a long-lived disturbance with bursts of intermittent activity and assuming forms differing widely from that of its first appearance on June 18 as a group of small spots near the east limb. It remained quite a small, though changeable, feature during the whole of its first passage over the disc. On its second passage from July 12 to 24 it was first a moderate-sized round spot, acquiring several outlying spots during the first few days of its journey, but eventually appearing as a group of small spots only. On its third appearance on August 9 it came over the limb as a moderate-sized irregular group with a leader and a rather larger trailer, both of which broke down to form groups of small spots. On reaching the C.M. on August 14 a new, large leader began to form, and was easily visible to the naked-eye. This remained light and irregular with many small umbræ within until it reached the west limb. It arrived on its fourth rotation in very similar form to that of its second appearance, and was first seen on September 4 as a moderate-sized regular spot with smaller spots around, in which form more or less it crossed the disc. It returned yet once more on October 1 as a smallish round spot, and developed a small companion preceding it before reaching the west limb. The leader appeared to have a forward drift in longitude of at least 5° in 27 days. If this was really all one disturbance it was an unusually long one, as the records cover a period of 116 days.

Mr. Leslie Woolven's Report for 1926.

A comparison with the year 1925 reveals an increase in spot activity generally, and whilst the figures for that year show the northern hemisphere to have been more affected than the southern, those for 1926 indicate a reversal, the southern being the more active.

The total number of 6-inch drawings was 148 and 73 were on a scale of 24 inches.

The total number of spot groups is made by observation of each separate disturbance on its appearance at the Sun's eastern limb or as it broke out on the disc, no account being taken of two or more rotations. The number of groups is 148, and has been sub-divided as before under two headings, viz., large and small, and grouped separately for north and south of the Equator.

The following table gives the percentages of groups north and south of both large and small, as well as the distribution of all spots with their respective percentages. For the sake of comparison the figures for 1927 are also included in this table, and at the foot are given the figures for 1925 from June 29 to December 31.

Table showing the Distribution of Spots North and South.

Year.	Number of Groups.	North.	%	South.	%	Percentage of Groups.			
						North.		South.	
						Large.	Small.	Large.	Small.
1926	148	68	45·95	80	54·05	47·06	52·94	48·75	51·25
1927	173	71	41·04	102	58·96	36·62	63·38	56·86	43·14
1925	67	34	50·75	33	49·25	67·65	32·35	39·39	60·61

The limits of parallel between which spot groups appear being wide, and the fact that some zones are more active than others, has led to the positions being measured of spots appearing within certain limits of latitude. The following table gives the percentage of groups which appeared within the limits of latitude stated.

Table showing the Distribution in Latitude.

Year.	North Latitude.			South Latitude.		
	0° to 10°	10° to 20°	Above 20°	0° to 10°	10° to 20°	Above 20°
1926 ..	14·71	52·94	32·35	16·25	57·50	26·25
1927 ..	23·94	59·16	16·90	34·31	51·96	13·73

With the exception of April and July all months had spots of notable activity and notes are appended of a few of these groups.

Faculæ, although at times slight, were always seen: the shape of the cloud-like masses being very varied and the general formation irregular with the exception that when seen surrounding a spot at or near the limb they were invariably star-shaped in form, *i.e.*, the clouds were ranged not necessarily symmetrically, but at all events radially from the spot or group. When seen further from the limb the formation became irregular and as a whole larger.

Notes on Some of the more Interesting Groups in 1926.

Group 13.—February 26 to March 10. Long. 250°, lat. S. 27°. A magnificently wild active and extended group, with a long irregular penumbra extending round the limb. Umbra was hook-shaped with two smaller umbræ. The penumbra *f* was massive and contained no umbra whatever.

March 1.—Elongated distorted penumbra with two long umbræ separated by a brilliant bridge. Many smaller umbræ in same penumbra.

March 4.—Penumbra rent in two long lines, enclosing many good-sized umbræ, the whole *f* by a single spot.

March 5.—Penumbra breaking up and containing many umbræ.

March 6.—Extending in east and west direction.

March 10.—Near *p* limb: seen as four regular spots with much faculæ.

Group 39.—May 9 to 16. Long. 35°, lat. S. 20°.

May 9.—A wild large penumbra enclosing several irregular umbræ: the whole *f* by a group of dots and penumbræ.

May 12.—More regular: leader with large hooked umbra; *f* by two regular spots.

May 13.—Very irregular umbra in leader; *f* by heavy multiple spot of three irregular umbræ in one penumbra, the whole attended by many dots.

Group 50.—June 3 to 16. Long. 37°, lat. N. 8°.

June 3.—Spot composed of three umbræ in one penumbra.

June 6.—*f* spot has double umbra: chain of dots linking leader and follower.

June 8.—Very active and the number of dots has increased.

June 9.—Marked by great activity; new penumbræ having broken out between the two main spots and containing many umbræ: the area of dots has increased.

June 10.—Well past C.M. and not so active.

June 13.—Leader now a fair regular spot; *f* by two others, and many dots.

Group 60.—June 22 to July 3. Long. 137°, lat. N. 21°.

June 23.—Fine double spot: *f* on 24 by trail of dots and a small regular spot.

June 26 and 27.—Very active: umbræ of leader very irregular; bridged and torn.

June 28.—The *f* spot with group of dots form almost a separate disturbance, the whole being of ring formation.

June 29.—The number of small dots near *f* spot increased.

July 1.—The leader more regular: *f* spot now accompanied by small regular spot. Number of small dots less.

Group 80.—July 25 to August 8. Long 92°, lat. S. 10°.

July 25.—A very wild and active group: leader with a long bridged umbra in a very large and irregular penumbra; *f* by two smaller spots and another penumbra with many dots.

July 27.—Umbræ of spots great in number but small in size.

July 29.—On C.M. Leader more condensed but with very irregular umbra. Penumbra very large. Many small umbræ and penumbræ grouped between leader and follower, the latter having a large penumbra with several small umbræ.

August 1.—Umbra of leader very irregular with penumbra showing signs of vortical motion. Several bridges seen.

Group 84.—August 4 to 14.—Long. 225°, lat. S. 18°.

August 4.—A very fine spot with large umbra *p* by a few dots and immersed in faculæ. (Evening of 4.) Number of dots increased; one quite a fair-sized one: faculæ very prominent.

August 5.—Umbra of main spot split in two.

August 6.—Penumbra has grown and four umbræ seen, the whole *p* by a small spot and many dots.

August 8.—Near C.M. and smaller.

August 11.—The *f* spot regular and *p* by a long-drawn out trail of small umbræ.

August 12.—The whole now a very widely extended group of three principal umbræ and many dots surrounded by faculæ.

Group 100.—September 14 to 27. Long. 137°, lat. N. 24°.

September 14.—One of the finest groups observed. First seen near N.E. limb as a bold irregular leader spot *f* by a second large penumbra with three small umbræ.

September 19.—The leader was past C.M. and the remainder of the disturbance was extended almost one-third back over the Sun's disc. The umbra of leader was elongated in an east to west direction and was very distorted and notched: a massive trail of umbra. This was followed by an extensive trail of penumbra and dots and then a large spot with pear-shaped umbra brought up the rear. Later in the day the umbra of leader split near the *p* end.

September 20.—The umbra of leader filled up again, many dots vanished. Umbra of *f* spot notched with bright tongues half bridging the umbra.

September 23.—Umbra of leader had assumed T shape, and a much more disturbed area *f*. The umbra of *f* spot more regular and larger.

Report for 1927.

Coming now to the work for 1927 it is disappointing to record the number of days on which no observations were possible, due to the very bad weather. Unfortunately, these days occurred in nearly every case when good groups were known to be in existence. There is, however, a slight increase in the number of both 6-inch and 24-inch drawings.

Referring to the table on page 36, it will be seen the total number of spot groups observed was 173. Numerically there is little difference between 1926 and 1927, but by adopting a percentage basis the results show that the preponderance of spots in the southern hemisphere in 1926 was accentuated in the year under discussion. There is also a falling off in the number of large spots in the northern hemisphere, while the southern shows an increase in the number of large disturbances.

Observations of faculæ indicate that the southern hemisphere has been more affected than the north by about 19 per cent. Groups of really large area have been about 14 per cent. greater in number in the south.

The table on page 36 showing the distribution in latitude shows very clearly the trend of activity towards the Equator in both hemispheres. Both show a falling away from high latitudes, but it is rather surprising to note the latitudes between 10° and 20° in the southern hemisphere show a lower percentage than in 1926. In other words the zones of activity in the southern hemisphere seem to have moved more rapidly towards the Equator than is the case in the north.

Notes on Some of the More Interesting Groups in 1927.

Group 37.—March 13 to 20. Long. 261°, lat. N. 33°.

In the N.E. quadrant a bold regular spot.

March 15.—The leader was followed by a group of dots and penumbral matter.

March 16.—Was still growing, and on the 20th was seen still more extended, the penumbral part of the disturbance having grown amazingly.

Group 54.—April 10 to 21. Long. 256°, lat. S. 14°.

In the S.E. quadrant, a medium spot, two umbræ in one penumbra *f* by a few dots. The growth of this group varied.

April 16.—The spot contained four separate umbræ.

April 17.—Only one umbra.

April 19.—Divided again into two.

April 20.—A group of dots visible only.

April 21.—Preceded by one small umbra and penumbra.

Group 57.—April 15 to 23. Long. 243°, lat. S. 11°.

A rather winding group composed of three spots in a very extensive penumbra which developed between April 16 and 17.

April 18.—Three entirely separate penumbræ each with multiple umbræ, which in some cases were partly bridged.

April 19.—Two penumbræ with three umbræ in *f* spot: the umbra in the leader was horned and partly bridged.

April 20.—Two regular spots, the umbra in both cases being partly bridged.

April 21.—The umbra of leader was seen split into three parts: the *f* spot was quite regular.

Group 59.—April 20 to May 1. Long. 128°, lat. S. 20°.

A regular looking spot, but throughout its transit it waxed and waned in size and when last seen was evident as a small umbra.

Group 75.—May 10 to 17. Long. 283°, lat. N. 17°.

Broken out since May 9 and nearing the C.M. A long extended group of spots and dots. The leader regular, *f* by irregular group of spots and dots.

May 13.—Leader very bold and irregular, a tiny portion of umbra being isolated, several patches of faculæ being observed in this umbra. The *f* spot had two elongated umbræ. Filaments bridging the umbra were clearly seen in both spots.

May 14.—Very irregular umbra in leader: the *f* spot had broken up into nine pieces and showed marked cyclonic action.

Group 90.—June 1 to 13. Long. 283°, lat. N. 16°.

A multiple spot composed of three umbræ in one penumbra.

June 2.—Four umbræ in very irregular penumbra, which on the 3rd showed a dark edge on the *p* side.

June 4.—Leader irregular with two umbræ and dots *f* by a group of small spots in broken penumbra.

June 5.—Still two umbræ in leader but the *p* one was bridged.

June 8.—Has developed into a huge disturbance, the leader with two very irregular umbræ, the *p* one was partly bridged in several places by bright faculæ. This umbra had also a tail almost its own length. On the *f* umbra of the same spot two flecks of white matter were seen. Then followed a mass of penumbra and spots defying description, but an extensive tongue of facula was seen cutting through the *p* portion of the penumbra. The rear of the group consisted of another irregular umbra and small spots in one penumbra.

June 9.—Penumbra of *p* spot was crossed by bright filaments. The other portion of group changed considerably.

June 13.—Nearing the west limb and much quieter. This disturbance throughout was accompanied by many irregular pieces of penumbral matter.

Group 113.—August 9 to 19. Long. 113°, lat. S. 10°.

Three small umbræ and penumbræ, *f* on 10th at some distance by three irregular spots.

August 14.—Scattered penumbra and dots, *f* by one regular spot, partly bridged over umbra. Then the penumbra grew and faded alternately.

August 17.—A decided twist was observed in filaments of penumbral filaments. Flecks of white matter were seen in penumbra and the chief umbra was horned and partly bridged.

When last seen on 19th this group was very wild and scattered. A group of intense interest.

Group 116.—August 17 to 26. Long. 24°, lat. N. 11°.

A small group of dots which died out about 18th.

Reborn on 21st as an extended group of dots.

August 23.—Growing rapidly; leader an irregular spot, *f* by small dots and a small spot in rear surrounded by small dots.

August 24.—Leader more regular with two umbræ: the trailer spot also had two umbræ.

Group 124.—September 11 to 18. Long. 63°, lat. S. 19°.

A nice looking group composed of a compact regular spot *f* by a few dots and another spot rather narrow and long.

This group showed a rapid growth and crossed the C.M. on 14th. On this day the leader was very irregular as was also the trailer.

September 17.—Many dots have disappeared and the two chief spots had consolidated: the umbra of the leader was parted throughout its entire length by a bright bridge.

The group was last seen on 18th when the umbra of the leader was crossed by a wide mass of white matter and on the umbra of the trailer was a similar tongue of white matter.

In both cases these faculæ were intensely bright.

Group 140.—October 18 to 24. Long. 276°, lat. S. 10°.

A group of two small spots and some scattered dots. Observations showed the number of dots to rise and fall and when last seen on 24th the group consisted of one small leader spot and a few dots following.

Group 151.—November 6 to 13. Long. 29°, lat. S. 9°.

When first seen consisted of a small spot and a few dots.

November 9.—Had developed into a nice group with large leader of five umbræ *f* by several dots and three small trailer spots.

November 11.—Growing rapidly; a massive leading penumbra with disjointed umbræ, *f* by a somewhat smaller irregular penumbra and several umbræ.

November 13.—The group now composed of three large penumbræ, each containing several umbræ. The south edge of the trailer penumbra was very dark.

Mr. G. H. Cheesman's Report for 1926.

This report is based mainly upon observations by the writer with a 5-inch reflector; but in some cases they are supplemented by observations by B. H. C. Turvey of Wimbledon with a 2-inch refractor.

In all 218 observations were obtained on 164 days.

On only one day were no spots seen on the sun. The total number of groups observed was 138; the monthly distribution of groups and observations is shown in the following table:—

Month.	Days of Observation.	Number of Groups.
January	19	11
February ..	11	10
March	12	5
April	20	9
May	21	12
June	16	13
July	11	10
August	11	13
September ..	15	12
October	11	15
November ..	5	13
December ..	12	15
Total ..	164	138

A diagram has been constructed to give a general idea of the distribution of the spot groups and it is seen from this and the table that so far as numbers are concerned the Sun's activity is being maintained. There was a distinct pause in the earlier part of the year, but subsequently considerable activity was shown. July showed a drop; the number of groups seen was only slightly reduced, but the only period when no spots were observed occurred during this month.

Drawings showing the principal details have been made, mostly on a scale of 15 inches to the solar diameter. It is felt that on most occasions the actual visible detail is not accurately reproducible on a larger scale, unless the seeing is good: though the fineness required in drawing such details might demand a larger scale, its more precise forms would not be accurately conveyed.

(Mr. Cheesman is investigating a new method of producing solar details, which seems to promise some interesting results, but with true scientific caution he is waiting to see what his method is worth before submitting it for discussion. It is

regretted, owing to the size of the diagram mentioned it is not possible to publish it.—THE DIRECTOR.)

Miss C. O. Stevens has been unable to send any regular work during the two years covered by this Memoir, but she has supplied several drawings of groups of sun-spots seen in September and October, 1926, one of which is reproduced.

Comparing this drawing with the photograph by Sellers, the general agreement will be at once apparent, but at the same time it will be seen the photograph shows definite small spots which in Miss Stevens' drawing are represented as penumbral markings. On the other hand, her drawing seems to be a very faithful indication of the group and it is possible changes may have taken place in the interval of time between the photograph and the drawing. The bridge in the trailer spot shown on the drawing is faintly visible on the photograph, which latter confirms the details as seen and drawn by Miss Stevens.

Dr. R. L. Robinson's Report for 1927.

Dr. Robinson, using a 6-inch Cooke equatorial refractor at Minehead, has made large-scale drawings of all the principal spot groups observed and annotated them. He has also kept a register of all spots and groups seen, plotting their positions on the smaller scale of 6 inches to the solar diameter, but he has not given their heliographic longitudes and latitudes. For the sake of identification these elements are given from other sources. In all, Dr. Robinson has observations for 150 days and extracts are given here from his records of many of the more striking features observed in large spots.

Several observations of cloud-like formations over the umbra of a spot have been obtained which apparently originated in a bridge, either over the umbra or in the penumbra.

There are also records of colour, usually of a greenish hue, seen in both umbræ and penumbræ, but the Director feels a little doubtful whether this is actually caused by some peculiarity in the spot or whether it is simply an atmospheric effect. The following notes are appended and in the main they deal with the naked-eye groups seen in 1927.

(THE DIRECTOR.)

Group in long. 283°, lat N. 16°.

June 1.—The large group of spots on the east limb was observed directly on the limb. It is difficult to be certain whether there is any dip in the solar limb, but there does appear to be a very slightly noticeable depression . . .

June 2.—The spot appears to be filling up—brilliant faculæ preceding.

June 4.—The group is large, with very extensive penumbra, which is furrowed by photospheric bridges. The group is now followed by a stream of very brilliant faculæ. A later observation showed the penumbral fringe a bright greenish hue. At

the *p* edge of the *p* spot the appearance was as if the facular clouds were being drawn down into the umbra.

June 6.—Group very large and complex: it appears to have divided.

June 8.—Shows an extremely complex character and is much elongated.

June 9.—Group still very extended, complex and active.

June 12.—Approaching the limb: less active.

June 14.—The large disturbance has disappeared, but bright faculæ were visible in the region and bright facular clouds were well seen all over the disc.

July 5.—Group in long. 280°, lat. N. 15°, is a very large disturbance; the penumbra is a greenish hue. The umbræ are numerous and scattered: the large spot appears about to divide and apparently a smaller division has already occurred.

July 8.—Nearing the limb; the group has much altered in character and seems to be filling up.

July 22.—Group in long. 344°, lat. S. 8°, is a very large regular spot . . . the penumbra is very much fringed; the filaments, at the extremities of the spot, being drawn out, almost looking like tentacles. At one extremity of the penumbra there appears a small oval-shaped white cloud. The umbra is toward the preceding side. Very bright faculæ in the region of the spot.

July 23.—Shows signs of great activity, but the total area of the penumbra is less. On one side two bright streaks of matter project into the penumbra, which has not the fringed appearance nearly so marked as yesterday. Observing this spot with a 3-inch telescope a curious pulsating effect was noted; it appeared as a series of puffs of some vapour and occurred regularly over the umbra at one end (N. end). It was faint, but on getting the 6-inch on to the spot it was seen once and then ceased.

July 29.—Has a circular penumbra with a fringed margin. The umbra is crossed by a bridge which is broad at its base and very bright near its origin but fades off at its termination and looks almost like a diffused cloud.

July 30.—Penumbra almost circular with a breaking off on the *f* side. It appeared greenish in colour. The umbra follows the penumbra in outline. There are three small projections of matter, the largest has a broad base. A small white cloud is present on the penumbra nearly opposite the central projection. A dark line (? small umbræ) crosses the penumbra on the *f* side.

July 31.—The dark line noted in the penumbra on the 30th is a stream of three small umbræ, which follow a slight projection of umbra. The main umbra shows the encroachment of the penumbra at several points and the penumbral filaments give a distinct impression of being drawn downwards into the umbra.

August 2.—Nearly on the limb and shows a definite cavity formation.

August 13.—Group in long. 113°, lat. S. 10°.

This group has developed into a very long chain of spots: the leader has a large spot, the penumbra lying on one side only and has a very broad blunt projection into the umbræ.

August. 14.—Has developed further since yesterday and is now a very complex disturbance with numerous umbræ and bridges. The penumbra at times appeared of a greenish hue. The largest umbra has a very fringed penumbra and across it appears an elongated cloud, in colour a deep grey: it has not the brightness of the bridges and no movement was detected in it.

August 16.—Appears rather less active; the numerous trailing portions have disappeared, but the spot is still very complex. . . . A very brilliant bridge projects over the main umbra which seems to be in the place of the cloud noted on the 14th.

August 17.—The most marked feature is the great white "prominence" (facula) which has all the appearance of a cloud hanging higher over the umbra than the penumbra. It is a very brilliant white and stands out in contrast with the surroundings and is certainly brighter than the other projections. At its base, which is narrow, is a large white area: it seems to blot out the penumbra. Two delicate filaments project from its upper (following) edge and link on to the penumbra.

August 18.—The great white cloud still extends across the umbra and retains its almost dazzling brilliance.

November 9.—Group in long. 29°, lat. S. 9°.

Activity has suddenly renewed itself: there is a large and conspicuous group near the central meridian. It is a highly complex group: the penumbræ appear to be a distinctly greenish hue. There are several minor scattered penumbral markings and a long chain of small umbræ following the main spot.

November 10.—The separate spots seen yesterday are still distinguishable but appear to be more united by penumbra. The *p* umbra is crossed by a thin bridge which shows shading at the thinner end, giving the impression that it was bending downwards into the umbra, disappearing under the overhanging penumbral fringe.

November 11.—The most marked feature of the *p* spot is the long curving bridge, which is very slender and unusually long. It is rather difficult to be certain whether it connects with the white cloud, but it certainly ends in that direction. In the penumbra to one side of the bridge is a dim cloud-like projection and a chain of very small umbræ passes from here outwards across the penumbra. . . .

November 12.—The *p* umbra is being filled up by the gradual extension of the base of the large bridge. This latter is broader than yesterday and shows several branches on either side. The *f* spot is crossed by several delicate filaments and the broad bridge with its extensive white base remains. Later in the day the *p* spot had divided into two.

November 14.—The group is breaking up; the penumbra of the *f* spot is ragged and broken. Only the *p* spot remains active. . . . It is approaching the limb and is preceded by a stream of faculæ extending to the limb.

Mr. A. F. Bennett's Report for 1926.

Observations of the disc and limb have been made, as regularly as possible, with the 6-inch Cooke equatorial refractor and a Thorp-Beck diffraction grating spectroscope.

The principal spot groups and faculæ have been sketched and recorded on a scale of 6 inches to the solar diameter; the heliographic positions being determined by the Stonyhurst method for identification. Drawings showing more detail have been made on a scale of 24 inches to the solar diameter in certain cases.

Some of the spot groups have been of unusual extent as, for example, those which were visible during rotations Nos. 967 and 968 in January and February, and the big double-spot formation, easily seen with the naked-eye during the third week in September, which followed a more or less quiescent period of some weeks duration.

The prominences have been observed in the H*a* line, their position angles, height and base lengths measured and records made of any special features or changes, apparent absorption effects, etc. Prominences, both of the quiescent and eruptive types, measuring upwards of 70 seconds of arc in height, have been frequent.

Observations have also been made of the spectra of spots and the chromospheric lines on occasions when unusual activity has been evident or suspected.

Briefly, as might be expected, the observations both of spots and prominences exhibit clearly the marked increase in solar activity during the year. From a quantitative review of the observational data, it would seem that this activity measured by the number, size and distribution of the spots, preponderated in the southern hemisphere; whilst, judged on the same basis by the prominence records, the northern hemisphere was the more active.

(Mr. Bennett regrets that from a variety of causes, among which the exceptionally bad weather ranks very high, it has not been possible to submit any reliable report for 1927.—THE DIRECTOR.)

Results of Observations for Prominences, 1926.

By A. M. NEWBEGIN, F.R.A.S.

The results of the year's working show a very decided increase in the number of prominences recorded, the mean daily average for the whole year being 15·64. In the first eight months the activity was remarkably steady and it was not until September

that any pronounced increase was recorded. From then down to the end of the year the activity was maintained, the mean daily number reaching its highest point in October.

The table gives the general details in a concise form.

TABLE 1.

Month.	Observations.	Prominences.	Mean Daily Number.
January	6	94	15·6
February	6	83	13·8
March ..	12	170	14·2
April ..	3	45	15·0
May ..	7	101	14·4
June ..	10	140	14·0
July ..	10	148	14·8
August ..	5	74	14·8
September	8	130	16·2
October..	10	197	19·7
November	4	69	17·2
December	9	162	18·0
Totals	90	1,413	15·64

April was a very bad month; apart from two or three fine days at the beginning there were prolonged periods of cloudy weather with much rain.

TABLE 2.

Showing the distribution of prominences.

Month.	North.	South.	East.	West.
January	46	48	50	44
February ..	45	38	44	39
March	81	89	85	85
April	21	24	26	19
May	48	53	49	52
June	85	55	77	63
July	73	75	81	67
August	47	27	34	40
September ..	67	63	68	62
October	112	85	101	96
November ..	38	31	37	32
December ..	87	75	81	81
Totals ..	750	663	733	680

These figures give a preponderance of 53 per cent. for the northern hemisphere, and 51 per cent. for the eastern limb. It will be noticed that the greatest activity alternated between north and south during the earlier months of the year, and became definitely northern in August.

There were only very slight differences between east and west, the fluctuations being of little significance.

Metallic prominences were recorded on 54 occasions, 63 per cent. being on the east limb; the distribution north and south

of the Equator was exactly equal. The great majority of these prominences came under Class 1, in which the b lines and D are the only lines affected. How far we are safe in classifying these metallic outbursts one would not like to say, as the slightest haze in the sky is sufficient to cut out some of the fainter chromospheric lines. But there is little doubt there is a different character in these prominences. Those which have been placed in Class 1 are usually of considerable duration, while those put into Class 3 are sometimes of very short life. In this latter class the red helium lines will always be found and usually fairly bright. The E group of iron lines are also often seen, but never in Class 1. In the year under discussion there were 8 prominences placed in Class 3, and on one occasion (December 29) 26 lines were seen to be affected. This display occurred at P.A. 295°, and was one of the densest prominences of the year. There was, however, very little change during the time it was under observation. It was undoubtedly associated with an extensive area of faculæ which was passing over the west limb at that time. The remains of this display were seen two days later, when the centre of the disturbance had moved 5° nearer the Equator.

It has seemed worth while to enquire if there are certain regions more favourable to the production of metallic activity than others. Too much reliance cannot be placed on the records owing to their intermittent character, due very largely to the vagaries of our climate, but there does appear to have been a certain latitude which was more prolific in activity than some of the others. There are discordances in longitude, however, which detract from the value of the results; but a table is given showing that of the 54 prominences observed, 15 were situated between latitude 20° and 30° north.

It is certainly remarkable that practically one-quarter of the metallic prominences recorded should be found within 10° of the same latitude.

TABLE 3.

Showing the positions of certain metallic prominences.

Date.	Latitude.	P.A.	Longitude.	Class.
	°	°	°	
January 4 ..	W + 24	294	W 35	3
18 ..	E + 27	63	E 31	2
March 3 ..	E + 24	66	E 162	1
13 ..	E + 20	70	E 31	1
May 13 ..	E + 20	70	E 304	1
24 ..	W + 28	298	W 344	2
June 15 ..	W + 21	291	W 49	2
22 ..	E + 22	68	E 138	1
23 ..	E + 21	69	E 122	3
August 24 ..	E + 26	64	E 22	1
October 7 ..	E + 15	75	E 164	3
9 ..	E + 24	66	E 136	1
11 ..	E + 20	70	E 112	1
18 ..	W + 20	290	W 199	3
December 29 ..	W + 25	295	W 330	3
31 ..	W + 20	290	W 303	2

The mean latitude from this table is 20°·8 north. (The prominence of October 7 is not included in this mean.) A comparison was made with the southern hemisphere, and it was found that there was but little uniformity in the distribution of metallic activity, the latitudes ranging from −43° to −12°, the average being at −15°.

There were not many massive prominences seen during the year, and nothing which could be called explosive; but a few were interesting, and notes are given of them here. The first really extensive prominence occurred on February 25 on the west limb at P.A. 304° (west +34°). The extent along the limb covered 14°, and the height was measured at 110″. The main feature of the cloud of gas was the strong tendency to curve northward. The longitude of the limb was 65°. On March 10, when the same longitude was on the east limb, it was found that this prominence had survived, and had grown to a height of 200″. The form was similar, but was more complicated. There was still the curve northward, but the prominence at the base was more compact, while the upper part was like a tree with long spreading branches. The centre of this disturbance was at east +38°, so it seems it had moved slightly northward. The region came to the west limb again on March 24, the longitude being 69°. In the interval the base had become very much extended, and now covered 40° along the limb, with the principal disturbance at west +37°. The tree formation still persisted at a height of 195″, and in addition, there were subsidiary growths on either side, with a detached bit of gas to the south, and a low arch to the north. On the previous day the same disturbance had been recorded, and it is worthy of note that the chief elevation of gas was curving very strongly southward toward another centre of disturbance which consisted of two delicate arches. On March 26 the prominence had nearly passed out of view, but at west +38° there was still a stream of gas reaching to a height of 125″, and the gas was now curving to the north about as many degrees as it had been south three days previously.

These curvatures of prominences are puzzling, for there seems to be no law about them; but possibly the movements of faculæ are responsible. In the instances given here this prominence was undoubtedly associated with an extensive mass of faculæ, and if we knew more of the laws governing faculæ an explanation might be forthcoming.

The next prominence of any note did not occur until July 16 in longitude 2°, on the west limb. Here was another mass covering 40°, with its centre at west +26°. It was of no great height, but there were seven arches all joined together and reaching 85″ from the limb. Here, again, faculæ were very pronounced. This prominence lived to come into view on the east limb on July 29, but it had diminished in size very considerably.

These prominences are typical examples of the quiescent type. Of the purely eruptive type there were very few striking instances, and so far as the records at Sutton go they were

all connected with spots. The distinction is made because to the writer it is not clear if faculæ produce the eruptive type of prominence, and it would be a useful piece of work if observers could settle the question whether spots are responsible for one type of prominence and faculæ for another.

Displacements of the H*a* lines were observed on 18 occasions, 12 of which were on the east limb. Of these 13 showed the line displaced to the violet. The movement of the line to the red was very rare, and many months elapsed between the first instance in January and the second occasion in September. In the latter month it was observed to the red on three occasions, and then there was an interval of nearly three months before it was again seen to be displaced to the red.

Results of Observations for Prominences, 1927.

By A. M. NEWBEGIN, F.R.A.S.

The work of the observatory was much hindered by bad weather and also by reason of the long contemplated move to a more sunny locality on the South Coast. Great difficulty was experienced in finding a suitable site, and it was finally decided to re-erect the observatory and 6¼-inch Cooke photo-visual telescope at Worthing.

The removal was carried out in the autumn, and the instrument again brought into use on December 29.

The position of the new observatory is:—

Latitude—North 50° 48′ 50″

Longitude—West 0^h 1^m 33^s

The results given here cover the first seven months of the year only, the telescope being dismantled on July 18 and sent to Messrs. Cooke, Troughton and Simms, Ltd, York, for a thorough overhaul.

The mean daily number of prominences was 17·55, a slight increase over the previous year.

Table 1 shows the monthly details:—

Month.	Observations.	Prominences.	Mean Daily Number.
January	5	96	19·2
February	2	35	17·5
March ..	3	50	16·6
April ..	8	132	16·5
May ..	10	183	18·3
June ..	11	189	17·2
July ..	4	70	17·5
Totals	43	755	17·55

The weather of the first three months was very bad, and accounts for the paucity in the number of observations.

Table 2 shows the distribution of prominences.

Month.	North.	South.	East.	West.
January	51	45	49	47
February ..	19	16	16	19
March	26	24	24	26
April	66	66	65	67
May	92	91	87	96
June	94	95	104	85
July	36	34	33	37
Totals ..	384	371	378	377

It will be seen the northern hemisphere was the more active throughout the seven months, while the numbers for east and west were uniform, but on the whole it seems the west limb was the more active, as the figures for the east limb were influenced by the higher number recorded in June.

Metallic eruptions were seen on 29 occasions, 58·6 per cent. being on the east limb and 55·17 per cent. south of the Equator. In connection with these metallic prominences it may be pointed out that the higher percentage for the south hemisphere is in agreement with the higher number of spots recorded in that region, the percentage for the latter being 64·6.

In 1926 the results indicated a certain region was more prolific in metallic eruptions than others. No such deduction is possible for this year; indeed, the activity was widely distributed, ranging from high spot latitudes to within 5° ± of the Equator.

The H*a* line was displaced on 15 occasions, 8 of which were to the red. On May 13 at west +21°, at $10^h\ 34^m$, it was seen to the red at the top of a dense prominence, and six minutes later it was displaced to the violet in the same portion of the disturbance—a change of direction not often seen in so short an interval of time.

One other prominence calls for notice as it exhibited displacement at a very high solar latitude. This was at east −80°. The line was to the violet at the base, and the filaments of gas were curving northward.

Dark absorption has been seen very little the last year or so, and only one instance occurred in 1927, but it is not very surprising that so little has been seen as the appearance seems to be associated with violent eruptions, and there has been nothing which could be so classed in the year under discussion.

Taking the year as a whole, so far as the words can be applied to the Sutton records, there has been very little that can be classed as big, and certainly the enormous outbursts which were such a feature of the previous maximum in 1916 and 1917 have so far not put in an appearance.

Memoirs
OF THE
British Astronomical Association.

VOL. XXIX.—PART III.

TWENTY-FIFTH REPORT OF THE SECTION

FOR THE OBSERVATION OF

JUPITER.

APPARITIONS of 1925 and 1926.

Director—Rev. T. E. R. Phillips, M.A., F.R.A.S.

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SECTION FOR THE OBSERVATION

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JUPITER.

DIRECTOR—REV. T. E. R. PHILLIPS, M.A., F.R.A.S.

TWENTY-FIFTH REPORT OF THE SECTION.

APPARITIONS OF 1925 and 1926.

INTRODUCTION.

The Report here presented covers a period of considerable interest to students of Jupiter. During the apparition of 1925 conditions on the planet's surface were about normal, but some time after its close changes took place on such a scale that when Jupiter was again seen in the early mornings of 1926 June, the familiar features of the Red Spot Hollow and the S. Tropical Disturbance had disappeared together with most of the S. Equatorial belt! The general aspect of the disc was accordingly very similar to that shown in 1919.

The 1926 apparition was also rendered interesting by the series of mutual eclipses of the Satellites for which Major A. E. Levin, Director of the Computing Section, had calculated the circumstances.

The position of Jupiter in the sky was extremely unfavourable for Northern observers in 1925, and very few members of the section found it possible to carry on systematic work. But with the improved altitude of 1926 much more observational

material was accumulated, and the Director is able to present here a satisfactorily full report of what proved to be a particularly interesting apparition. Some of those who had made valuable contributions in previous years dropped out temporarily owing to various causes, but the Section was fortunate in having once again the help of Instructor Captain Ainslie, whose colour notes and transit observations were most welcome and valuable. Mr. Peek's contributions formed in both years a considerable portion of the Section's output of work, and a number of notes and some transits were also received from Mr. Sargent, despite the claims of other work and the unfavourable observing conditions he experienced. The Director has also received a drawing from Mr. F. J. Hargreaves, his first contribution to the work of the Section of which he has since proved so enthusiastic and successful a member. Unfortunately very few drawings have been sent in other than those by Mr. Peek and the Director, which explains the preponderance of the Director's representations of the Planet in the plates.

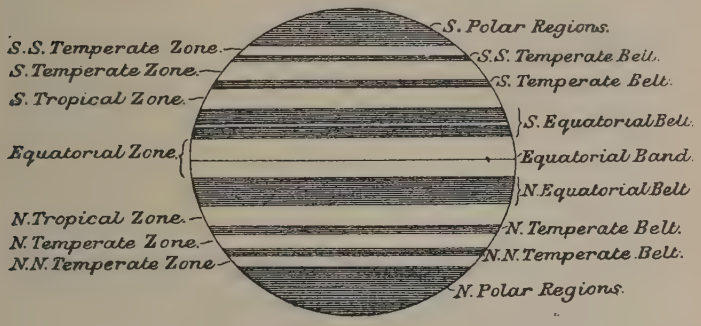
A summary and discussion of the Director's micrometer measures of the belts during the 20 apparitions 1908-09 to 1929-30, together with notes on the motion of the Red Spot in latitude, will be found at the end of this Report.

The following is the list of those from whom observations, drawings, or notes relating to the apparitions of 1925 and 1926 have been received, together with a statement of their locality and instrumental equipment:—

Name.	Locality.	Instrument.
AINSLIE, Instructor - Capt. M. A., R.N., B.A., F.R.A.S.	Finchley, N.	9-in. spec.
BRIDGER, J. H., Mus.B.	Croydon	8½-in. spec.
BRINDLEY, T.	Sydney, N.S.W.	3-in. O.G.
CROTCH, W. J. B., M.A., A.K.C.	Norwich	2⅞-in. O.G.
HARGREAVES, F. J., F.R.A.S.	Kingswood	6½-in. spec.
MARTHERAY, C. F. DU-	Geneva	8½-in. spec.
MERLIN, A. A. C. ELIOT	West Ealing	12-in. spec.
PEEK, B. M., M.A., F.R.A.S.	Herne	6-in. O.G., 12½-in. spec.
PHILLIPS, Rev. T. E. R., M.A., F.R.A.S.	Headley, near Epsom	8-in. O G., 12¼-in. spec.
RYVES, P. M., F.R.A.S.	Headley	8-in. O.G., 12¼-in. spec.
SARGENT, F., F R.A.S.	Durham	5-in. O.G., 10-in spec.
WATERFIELD, Dr. R. L., F.R.A.S.	Headley	8-in. O.G., 12¼-in. spec.
WILLIAMS, A. S., F.R.A.S.	St. Mawes, Cornwall	6½-in. spec.

It is fitting that reference should here be made to the death since the issue of the last Report of an old member of the Jupiter Section—Mr. Scriven Bolton. Mr. Bolton was for several years a very active and enthusiastic observer of Jupiter, and his contributions to the work of the Section will be found in the Memoirs relating to the apparitions of 1898 to 1909-10 inclusive.

The nomenclature adopted in this Report is the same as in former years, and is given in the accompanying diagram.



SYSTEM OF TIME RECKONING.

On 1925 January 1 the system of reckoning the hours of the Astronomical day, like those of the civil day, from *midnight* came into official use. It is, however, found that in certain types of observational work, such as that of the Jupiter Section, the inconvenience of a discontinuity of date in the middle of the night is very great indeed, and is apt to result in much uncertainty and confusion in the charting and reduction of observations. In the work and publications of this Section, therefore, as in the case of the Variable Star Section, the old time-system is retained, and the times given in this Report are reckoned—as in the *Julian Day*—from Greenwich Mean *Noon*. For time so reckoned the letters G.M.A.T. (Greenwich Mean Astronomical Time) were approved at the meeting of the International Astronomical Union held at Leiden in 1928.

The following symbols are used in this Report:—

ω_1, ω_2 = longitude according to Systems I and II respectively.
λ_1, λ_2 = longitude of central meridian of the illuminated disc according to Systems I and II respectively.
$\mathcal{S}$ = opposition.

The daily motions and rotation periods of the zero meridians of the two systems are:—

	°	h	m	s
System I	877·90	9	50	30·003
System II	870·27	9	55	40·632

APPARITION OF 1925.

Date of Opposition: 1925 July 9^d 22^h.
Position of Planet: R.A. 8^h 47^m Dec. $-19°$ 11′.
Equatorial diameter: 47″·3.
Zenocentric declination of the Sun: $-1°·45$.
Zenocentric latitude of centre of Planet's disc as seen from the Earth: $-1°·41$.

NOTES ON THE GENERAL APPEARANCE OF THE DISC, COLOURS, &c.

N. Polar Regions.—Quiet and without special features. Colour *grey*.

N.N. Temperate Zone.—The Director found this zone *white* on June 10 (Plate I., fig. 2), but on July 4 and September 14 noted that the disc was rather heavily shaded from the N. Temperate belt to the Pole. Peek recorded a similar appearance on August 6, and described the colour as "*greyish.*" A drawing by the Director on September 14 shows this shaded part of the disc unusually dark, and in striking contrast with the intense whiteness of the N. Tropical zone (Plate I., fig. 6).

N.N. Temperate Belt.—Very feeble in some longitudes. Noted by Peek as "a thin but obvious line" on August 3, but as "invisible" on August 6. A few dark condensations seen.

N. Temperate Zone.—Usually covered by the greyish shading described above, but a large white spot was seen on the zone which extended across the N.N. Temperate belt on August 16 (Plate I, fig. 5).

N. Temperate Belt.—Rather dark and broad, especially at first, with some irregularities of intensity. Double in some longitudes. *Neutral tinted* in colour.

N. Tropical Zone.—Very wide owing to the retreat southwards of the N. edge of the N. Equatorial belt. Peek noted that it was about equal to the equatorial zone in width. It was *very white* and recorded as "much the brightest zone" on June 10. Later it presented a striking contrast with the dull grey which covered the N. hemisphere from the N. Temperate belt to the Pole (Plate I, fig. 6).

N. Equatorial Belt.—The diminution in width which had set in during 1924 was continued after the close of the apparition, and the belt was much narrower in 1925 than it had been during the previous three years. Several irregularities were seen and

followed at the S. edge. The colour was *neutral* according to the Director's notes on June 10 and September 14, and the belt seems to have been devoid of redness throughout the apparition.

Equatorial Zone.—*" A dull brownish yellow "* was noted by the Director as covering this zone on June 10, and the dullness persisted during the succeeding months apart from some brighter areas and white spots, especially near the S. edge of the N. equatorial belt. The zone was obviously very inferior to the N. tropical zone in brightness.

S. Equatorial Belt.—The belt presented at first its usual duplex character with some bright areas between the two components, but towards the latter part of the apparition it often appeared as a single broad band (Plate I, figs. 5 and 6). Some irregularities associated with dark condensations and gaps in its N. component were recorded, and on June 10 (Plate I, fig. 2) and July 7 especially the Director noted that the S. edge was very jagged with dark projections and small intermediate white spots. On September 14 he found the N. edge of the belt soft and diffuse (Plate I, fig. 6). The Director's colour estimate was: *distinctly reddish* on June 10. On September 14 he recorded it as exhibiting *" a strong reddish tone* especially at twilight," and found it definitely *ruddy* on various other occasions.

Red Spot and Hollow.—The Red Spot Hollow (ω_2=90° at opposition) was very shallow throughout the apparition. Sargent wrote on July 11: " The R.S.H. seen in transit, but it is quite a weak feature as compared with its old form, and on the usually poor nights may easily pass unnoticed." Remarks in the Director's observation book are in agreement with this comment.

The Hollow was generally seen as a whitish elongated or oval area bounded at its *p* and *f* ends by dusky shadings on the S. Tropical zone. The shading on the *f* side seemed during the latter part of the apparition to encroach on and overlie the extreme *f* end of the Hollow, rendering the position of the *f* shoulder very difficult of determination.

The Red Spot itself was seen by the Director on August 16 (Plate I, fig. 5) and September 14 as a faint elliptical ring in contact with the S. Temperate belt.

S. Tropical Disturbance.—The *p* and *f* ends (ω_2 at opposition = 150° and 300° respectively) were well defined, but the disturbance varied much in intensity in different longitudes. There was a rather well defined ending of the darker *p* portion noted in July and August (Plate I, figs. 2 and 3), and several other details in the form of dusky wisps and bright spots were recorded. There were also the usual white spots at the *p* and *f* ends of the Disturbance. No distinctive colour was noted.

S. Tropical Zone.—In addition to the *Disturbance* just referred to, a dusky shading was observed crossing the zone on the *p* side of the Red Spot Hollow. This was found to be drifting back in the direction of increasing longitude to meet the advancing Hollow, and conjunction with the *p* shoulder occurred near

the end of August (compare drawings in Plate I, figs. 1 and 5). Earlier faint shadings had been observed about both shoulders, and, as mentioned in the paragraphs describing the Red Spot Hollow, it became very difficult to determine the actual position of the *f* shoulder owing to the development of the S. tropical shading about that longitude.

S. Temperate Belt.—Rather strong and dark as a whole with some irregularities in the form of dark condensations and white spots at its S. edge (drawings of Plate I). The Director recorded the colour as *bluish* on June 10.

S. Temperate Zone.—This zone had lost the whiteness which had been so marked in 1924. It was irregularly shaded in 1925 with some white spots, and a few dusky wisps were seen crossing the zone from the S. Temperate to the S.S. Temperate belt (drawings of Plate I).

S.S. Temperate Belt.—Faint in some places but otherwise well defined. A few dark condensations were observed and followed (Plate I, figs. 4, 5, and 6).

S. Polar Regions.—Generally very quiet and without definite features. A dark condensation was seen at its N. edge on August 7 (Plate I, fig. 3).

LATITUDES OF THE BELTS.

The principal belts were measured on three nights by the Director with the 8-in. refractor, and, as in former years, the measures have been reduced to *zenographical* latitude. In the calculations a slight change has been made in the adopted value of the planet's ellipticity, the polar diameter being now taken as $\frac{14}{15}$ of the equatorial diameter as on p. 788 of the *Nautical Almanac* for 1931, instead of $\frac{14\cdot53}{15\cdot53}$ as heretofore. The difference in the deduced latitudes is, of course, inappreciable.

The measures of 1925 indicate that the narrowing of the N. Equatorial belt, which had begun in 1923 and was continued in 1924, was maintained, the width in 1925 being only some 7° as against 14½° in 1922!

There were no other marked changes in position or width of the belts.

LATITUDES OF THE BELTS 1925.

MEASURES BY THE DIRECTOR.

Date. 1925.	N. Temp. Belt. N. Edge. Fraction of Polar semi-diam. from centre of disc.	N. Temp. Belt. N. Edge. Zenograph. latitude.	N. Temp. Belt. S. Edge. Fraction of Polar semi-diam. from centre of disc.	N. Temp. Belt. S. Edge. Zenograph. latitude.	N. Equat. Belt. N. Edge. Fraction of Polar semi-diam. from centre of disc.	N. Equat. Belt. N. Edge. Zenograph. latitude.	N. Equat. Belt. S. Edge. Fraction of Polar semi-diam. from centre of disc.	N. Equat. Belt. S. Edge. Zenograph. latitude.	S. Equat. Belt. N. Edge. Fraction of Polar semi-diam. from centre of disc.	S. Equat. Belt. N. Edge. Zenograph. latitude.	S. Equat. Belt. S. Edge. Fraction of Polar semi-diam. from centre of disc.	S. Equat. Belt. S. Edge. Zenograph. latitude.	S. Temp. Belt. Centre. Fraction of Polar semi-diam. from centre of disc.	S. Temp. Belt. Centre. Zenograph. latitude.	S.S. Temp. Belt. Fraction of Polar semi-diam. from centre of disc.	S.S. Temp. Belt. Zenograph. latitude.
June 18	+·537	+32·8	+·389	+22·5	+·209	+12·4	+·102	+4·7	−·113	−8·6	−·273	−18·5	−·441	−29·4	−·650	−44·1
			+27·7													
	Centre of Belt.															
	Fraction of Polar semi-diam. from centre of disc.	Zenograph. latitude.														
July 30	+·481	+28·9			+·224	+12·2	+·114	+5·4	−·102	−7·9	−·292	−19·7	−·463	−29·8	—	—
Nov. 26	+·479	+29·0			+·271	+15·5	+·153	+8·1	−·069	−5·6	−·247	−16·6	−·464	−29·4	—	—
Mean latitudes ..		+28·5				+13·4		+6·1		−7·4		−18·3		−29·5		−44·1
							+9·8				−12·9					

ROTATION PERIODS.

In addition to the transit observations obtained by the Director a few were also secured by Peek and Sargent, but the total amount of available material was scanty. With the planet so poorly placed for observation in northern latitudes, and nothing under this heading coming from the Southern Hemisphere, this was only to be expected, but fortunately the more important objects were followed sufficiently to establish their general drift.

The more noteworthy points arising from a comparison of the 1925 results with those of the previous few years are the following:—

1. The accelerated motion of the Red Spot observed in 1924 was continued, though the observations indicate a slight increase in the mean period of about 1 second.

2. The S. Tropical Disturbance again showed a rotation period slightly exceeding that of the Red Spot. The figures on p. 61, however, indicate that the difference was mainly due to the relatively slow motion of the *f* end of the Disturbance.

3. A dusky shading on the S. Tropical Zone on the *p* side of the Red Spot was well observed, and found to have an unusually long rotation period for the latitude. It appeared as if drawn back to meet the advancing spot, so that although over 30° separated the two objects in the middle of June conjunction with the *p* shoulder of the Red Spot Hollow occurred during the last week in August.

4. The S. Temperate Spots, which in recent years (excepting 1924 when no results were recorded) had exhibited an unusually quick rotation for the latitude, as if in part controlled by the swifter current further south, had become considerably retarded, the mean period being about 8 seconds longer than in 1923.

5. The light and dark spots at or close to the S. edge of the N. Equatorial belt also showed a definite retardation. The rotation period had been unusually short in 1923 and 1924, but increased to $9^h\ 50^m\ 21{\cdot}3^s$ in 1925.

In column 2 of the following Tables D = dark, W = white. In column 3 the inclusion of figures in brackets indicates that the spot was not observed (or did not exist) about the time of opposition. The opposition longitude is inferred from the previous or subsequent motion of the object. The figures in column 6 are given to facilitate, when taken in conjunction with

those in column 3, the possible identification of objects in successive apparitions.

N.N. TEMPERATE SPOT.

No.	Description.	Longitude at δ	Limiting Dates.	No. of Observations.	Approx. Change of Longitude in 30 days.	Rotation Period.
		ω_2 °			°	h m s
—	D - -	(285)	Aug. 13–Sep. 18	4	+ 4·0	9 55 46·1

N. EQUATORIAL SPOTS.

		ω_1 °			°			
1	D - -	(10)	Aug. 13–Sept. 23	5	— 3·0	9	50	26·0
2	D - -	48	June 28–Sept. 21	5	— 7·3	9	50	20·2
3	W - -	58	June 28–Sept. 21	7	— 7·5	9	50	19·9
4	D - -	72	June 28–Sept. 21	7	— 7·2	9	50	20·3
5	D - -	(186)	Aug. 2–Sept. 13	5	— 5·0	9	50	23·3
6	W - -	198	June 15–Sept 13	7	— 5·2	9	50	23·0
7	D - -	272	July 4–Oct. 25	5	— 8·5	9	50	18·6
8	W - -	286	July 4–Oct. 25	7	— 8·0	9	50	19·2

Mean Rotation Period = 9h 50m 21s·3.

S. EQUATORIAL SPOT.

		ω_1 °			°			
—	D - -	(171)	July 12–Aug 16	4	— 2·5	9	50	26·6

RED SPOT.

		ω_2 °			°			
—	Centre of Spot	90	June 9–Nov. 26	12	— 5·3	9	55	33·4

S. TROPICAL DISTURBANCE.

		ω_2 °			°			
1	p end -	150	July 4–Dec. 6	14	— 4·7	9	55	34·2
2	f end -	300	May 25–Oct. 15	14	— 1·4	9	55	38·7

Mean Rotation Period = 9h 55m 36s·4.

SHADING ON S. TROPICAL ZONE.

		ω_2 °			°			
—	D - -	52	June 9–Aug. 21	10	+ 6·6	9	55	49·7

S. TEMPERATE SPOTS.

No.	Description.	Longitude at δ	Limiting Dates.	No. of Observations.	Approx. Change of Longitude in 30 days.	Rotation Period.
		ω_2 °			°	h m s
1	W - -	(26)	June 28–Sept. 5	5	— 14·3	9 55 21·1
2	D - -	154	June 10–Oct. 7	6	— 13·0	9 55 22·8
3	W - -	183	June 10–Oct. 7	6	— 12·3	9 55 23·8

Mean Rotation Period = 9h 55m 22s·6.

S.S. TEMPERATE SPOTS.

		ω_2 °			°			
1	D - -	(49)	Aug. 11–Oct. 10	5	— 25·3	9	55	6·0
2	D - -	(80)	Aug. 11–Sept. 14	3	— 21·0	9	55	11·9
3	*f* end of dark part of belt	130	July 4–Aug. 26	3	— 22·7	9	55	9·6
4	D - -	306	June 30–Aug. 13	3	— 26·0	9	55	5·0

Mean Rotation Period = 9h 55m 8s·1.

SUMMARY.

Current.	1922.		1923.		1924.		1925.	
	Rotation Period.	No. of Objects.	Rotation Period.	No. of Objects.	Rotation Period.	No. of Objects.	Rotation Period.	No. of Objects.
	h m s		h m s		h m s		h m s	
N. Polar Spots	—	—	—	—	—	—	—	—
N.N. Temp. Spots	—	—	—	—	—	—	9 55 46·1	1
N. Temp. Spots	9 55 55·7	2	—	—	—	—	—	—
N. Trop. Spots	9 55 20·6*	7	9 55 23·5	4	—	—	—	—
N. Equat. Spots	9 50 26·4	12	9 50 9·7	10	9 50 12·9	8	9 50 21·3	8
S. Equat. Spots	9 51 14·9	4	9 50 48·1	1	—	—	9 50 26·6	1
Red Spot or Hollow	9 55 39·1	3	9 55 36·8	3	9 55 32·4	3	9 55 33·4	1
S. Trop. Dist.	9 55 31·7	2	9 55 31·7	1	9 55 37·4	3	9 55 36·4	2
Other S. Trop. Objects	—	—	—	—	—	—	9 55 49·7	1
S. Temp. Spots	9 55 15·0	2	9 55 14·3	4	—	—	9 55 22·6	3
S.S. Temp. Spots	9 55 10·7	1	9 55 7·8	1	—	—	9 55 8·1	4
S. Polar Spots	—	—	—	—	—	—	—	—

* See pp. 5 and 6 in 24th Report of the Section.

APPARITION OF 1926.

Date of Opposition: 1926 August $15^d\ 8^h$.

Position of Planet: R.A. $21^h\ 40^m$, Dec. $-15°\ 9'$.

Equatorial Diameter: $48''{\cdot}9$.

Zenocentric declination of the Sun: $+\ 0°{\cdot}33$.

Zenocentric latitude of centre of Planet's disc as seen from the Earth: $+\ 0°{\cdot}57$.

NOTES ON THE GENERAL APPEARANCE OF THE DISC, COLOURS, &c.

As soon as the planet was observed in the morning sky at the beginning of June it was seen that a great change had come over its appearance; the general aspect being strikingly similar to that presented during the greater part of 1919. The S. Tropical Disturbance, the Red Spot Hollow, and nearly all the S. Equatorial Belt, except its N. portion which remained well-defined though narrow, had disappeared. The Red Spot itself, however, as in 1919, gradually became more distinct and prominent.

A detailed account of the surface features is given in the following notes:—

N. Polar Regions.—Some details were seen in this part of the disc, viz., a few dark condensations and a curious slant of the S. edge (Plate IV figs. 4 and 5). On September 30 Ainslie noted that the N. Polar Regions were much *bluer* than the S. Polar Regions, and Bridger also recorded the colour as *bluish*.

N.N. Temperate Belt.—This belt was in general very feeble and at times invisible. This was often remarked by Peek and the Director; but there was a darker portion of which the *p* end was well defined, and on September 30 the Director saw a series of dusky condensations, one of which in about $\omega_2 = 50°$ was quite a dark object (Plate IV, fig. 5).

N. Temperate Zone.—A narrow and faint band was sometimes observed on this zone (Plate III, fig. 4, Plate IV, fig. 4) near the N. edge of the N. Temperate Belt, but as a rule only small fragments of it were seen in the form of short streaks. Two of these were successfully followed and, together with a white spot (Plate III, figs. 2, 3 and 4), exhibited the long rotation period of just over $9^h\ 56^m$. A very minute black spot was seen by the Director near the centre of the zone on July 31 in $\omega_2 = 25°$ (Plate III, fig. 1), and a similar, or perhaps, the same, object in $\omega_2 = 38°$ on August 27.

N. Temperate Belt.—This belt was rather dark and strong on the whole, but showed comparatively little detail. There was, however, a hump or "shoulder" at its S. edge (Plate III, fig.

2, Plate IV, figs. 3 and 4) which possessed the same exceedingly rapid drift (rotation period $=9^h\ 49^m$) as spots in about the same latitude in 1880 and 1891 and quite recently in 1929. A discussion of this noteworthy phenomenon is given on pp. 69, 70. The N. Temperate Belt was recorded by the Director on July 11 as *blue grey* and on July 30 as *cool-grey*. Ainslie called it *greyish* on August 27, but on September 19 at $10^h\ 50^m$ wrote "The N. Temperate Belt has a very curious but unmistakable *purple* hue."

N. Tropical Zone.—This was perhaps the brightest of the zones during part of the apparition, though its intensity was certainly much diminished as compared with its appearance in 1925. Bridger recorded its colour as *quite orange*. Ainslie as *cream-white* on August 29 and September 18, but it was still the brightest part of the disc to him on October 7. The Director on December 3 and January 9 placed it second in order of brightness to the S. Tropical Zone.

N. Equatorial Belt.—This was again a conspicuous belt and apparently a little wider than during the previous apparition. Irregularities similar to those seen in 1925 along its N. edge were again in evidence, and there seems to have been increased activity at its S. edge. No less than 28 light and dark objects bordering the Equatorial Zone were satisfactorily followed as compared with 8 during the previous year, and the difference can hardly be wholly due to the planet's improved altitude for Northern Observers. The disturbed condition of this region was particularly noted by Brindley in Sydney, N.S.W., using only a 3-inch refractor. In colour Ainslie's estimates give the belt a *brown* or *rather warm* tinge in August, ("*coppery*" on 28th), especially near its N. edge. His later notes make it "*fiery*" in September, but on October 3 he described it as "distinctly inclined to *fiery* but *not red*." Bridger recorded the belt as *rather dull brown*. According to the Director's estimates it was *chocolate* in July, *decidedly red* on October 26 and November 19, and was noted as showing a *strong reddish tinge* on December 21. There is no doubt that this belt possessed a considerably warmer tone than any other except possibly during the earlier part of the apparition.

Equatorial Zone.—There were the usual details in the way of wispy shadings and mottlings with white spots, especially bordering the N. Equatorial Belt, and the narrow Equatorial Band was also seen on several occasions (Plate II, figs. 3 and 4; Plate IV, fig. 4), but does not seem to have been continuous in all longitudes. On the whole the zone was lightly shaded as in 1925, and it was in general definitely inferior in brightness to the N. and S. Tropical Zones. Ainslie described the colour on September 18 as "remarkable—*a cold light slate, almost bluish*—contrasting with the cream white of the N. Tropical Zone and the space between the S.E.B.$_N$ and S. Temperate Belt." The Director recorded the colour as *greyish* on January 9

S. Equatorial Belt.—As above stated nearly the whole of this belt had disappeared during the period of the Planet's invisibility, only its N. portion with fragments and feeble traces of its S. component remaining. The surviving N. component was narrow but fairly dark. Its tone was *chocolate* according to the Director's estimate on July 11. On August 27 and September 13 Ainslie noted that it was warmer in tone than the N. Temperate Belt (but "not quite red" on the former date), and on September 7 he described both Equatorial Belts as *light brown*. On September 19 he remarked that the S.E.B.$_S$ was inclined to be *fiery*.

The S. component of the belt was several times observed during the earlier part of the apparition as a narrow and extremely delicate line. (Plate II, figs. 1, 3, 6, see, too, Plate IV, fig. 3) and it is noteworthy that it was seen and drawn by Peek on July 30 when using his 6-in. refractor with a 3-in. stop on without knowing it! There were also two dark spots, to which the names "remnant" and "fragment"—as suggested by Dr. R. L. Waterfield—became attached, which were quite conspicuous, and survived till at least the end of September or beginning of October (Plate II, figs. 2, 3, 4; Plate IV, figs. 2, 3 and 4). They were at ω_2=143° and 224° at opposition, and were both well observed. (See *Rotation Periods, p.* 72.)

Red Spot.—As in 1919-20 the disappearance of the Southern portion of the S. Equatorial Belt and the familiar Hollow was the occasion for the Red Spot to display greatly increased prominence. In June all that was noted by the Director was a diffuse dusky shading with its *p* end sloping in the *sp* direction (Plate II, fig. 1), but early in July the Spot presented the aspect of an elliptical ring darker at its *f* end and with a dusky appendage at its *p* end (Sketch, fig. 1). By the middle of the

July 9. T. E. R. P.

July 16. T. E. R. P.

month the Spot had developed a sharply pointed *f* end (fig. 2), and by the close of the month both ends were pointed (Plate III, fig. 1).

Ainslie recorded on September 15 that the Spot, which was in contact on its S. side with the S. Temperate Belt, showed a

distinctly *warm* colour quite different from that of the S. Temperate Belt which was *cold grey*. Du Martheray found the edges of the Spot a *deep red*. especially at its *f* end.

The opposition longitude (ω_2) of the Spot was 21°, and its length, excluding the appendage on its *p* side, rather over 30°.

S. Tropical Zone.—This was on the whole a bright zone, but its intensity was not uniform. On August 28 the Director found a faint shading covering both the zone and the region of the S. Equatorial Belt immediately *f* "fragment" as shown on the accompanying sketch. On the other hand the zone *f* the

T. E. R. P.

Red Spot seemed to him particularly bright on August 22. On November 5 he noted that the region between the S. component of the S. Equatorial and S. Temperate Belts was *very white*, while on December 21 he rated the portion of the zone on the *p* side of the Red Spot as the brightest part of the disc. The zone was once again recorded as very bright as late as January 9.

Ainslie, on September 18, considered the colour of the whole space between the S.E.B.$_N$ and the S. Temperate belt *cream-white* like the N. Tropical Zone. To Bridger, the colour was much paler than that of the latter.

S. Temperate Belt.—This belt varied greatly in intensity in different longitudes. In many places it was exceedingly faint and inconspicuous. To Bridger, on October 10, it was nothing more than a "sharp boundary line to the S. Polar Regions." Peek remarked on July 11 that it "could not be seen at all," and again on November 1 at 6^h that it was "barely distinguishable." On September 7 Ainslie recorded that there was "hardly a trace of any belt S. of the S.E.B.$_N$, just a shading from S. Polar Regions." On October 26 the Director wrote "The S. Temperate Belt is exceedingly faint and seems to be disappearing"; on December 3 "S. Temperate Belt practically invisible," and on January 23 "very little could be seen of the S. Temperate and S.S. Temperate Belts." But on the other hand there were some places where the belt was particularly dark and wide. There were also one or two very bright spots. (*See* drawings on Plate II, figs. 1, 4; Plate IV, figs. 3, 4.) The colour of the belt was *grey*.

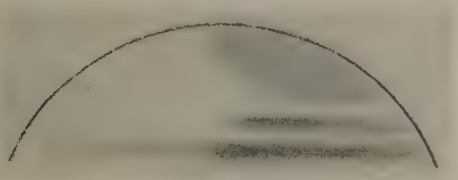
S. Temperate Zone.—Some dusky shadings were observed on this zone connecting the S. Temperate and S.S. Temperate Belts. On July 20 a broad band was observed by the Director in the S. portion of the zone in about the same longitude as a dark

portion of the S. Temperate Belt, but it seems to have quickly faded.

S.S. Temperate Belt.—This belt like the S. Temperate Belt was very feeble in some longitudes, and at times invisible. But there were places where it showed considerable detail in its structure (Plate II, figs. 2, 3; Plate III, figs. 2, 3, 4; Plate IV, figs. 2, 4 and 5), and one or two spots were well observed. The colour of the belt was *cool grey*.

S.S. Temperate Zone.—The soft grey shading of the Polar area seemed in many places to overflow this zone, but there was one particularly bright region noted by Ainslie, Peek and the Director in August and September. Its exact limits were not easy to define, but several transit observations place its *f* end in the neighbourhood of $\omega_2 = 140°$. The deduced values scatter somewhat, and there is no certain evidence of drift relatively to the System II longitudes. The region is well shown on Ainslie's drawing of August 30 (Plate III, fig. 5).

S. Polar Regions.—Very quiet and usually without distinctive features. But on December 4 Mr. A. A. C. Eliot Merlin noted the curious aspect of the S. hemisphere shown in the accompanying sketch ($\lambda_2 = 326°$), and on January 9 following, the



Dec. 4. A. A. C. E. Merlin.

S. Polar Regions presented a very similar appearance to the Director with the central meridian 318° (System II). Bridger recorded the colour of this region as *dark grey*.

LATITUDES OF THE BELTS.

The Director measured the belts with the 8-in. refractor on two nights in 1926. Apart from the disappearance of the S. portion of the S. Equatorial Belt, the most marked change shown in the distribution of the belts was the motion southwards of the N. Temperate Belt by about 3°.

LATITUDES OF THE BELTS 1926.

MEASURES BY THE DIRECTOR.

Date. 1926	N. Temp. Belt.		N. Equat. Belt. N. Edge.		N. Equat. Belt. S. Edge.		S. Equat. Belt. Centre of N. Component.		S. Temp. Belt.		S.S. Temp. Belt.	
	Fraction of Polar semi-diam. from centre of disc.	Zenograph. latitude.	Fraction of Polar semi-diam. from centre of disc.	Zenograph. latitude.	Fraction of Polar semi-diam. from centre of disc.	Zenograph. latitude.	Fraction of Polar semi-diam. from centre of disc.	Zenograph. latitude.	Fraction of Polar semi-diam. from centre of disc.	Zenograph. latitude.	Fraction of Polar semi-diam. from centre of disc.	Zenograph. latitude.
		°		°		°		°		°		°
August 30	+·407	+26·0	+·228	+14·6	+·091	+6·1	−·155	−9·0	−·471	−29·3	−·645	−41·7
September 28	+·381	+24·2	+·297	+13·1	+·093	+6·1	−·170	−10·1	−·451	−28·0	−·617	−39·6
Mean latitudes		+25·1		+13·9		+6·1		−9·5		−28·7		−40·7
				° +10·0								

ROTATION PERIODS.

With the increased altitude of the planet for Northern observers in 1926 there is much more material available for the determination of rotation periods than had been obtained during the previous few apparitions.

The following are the most important results to be noted:—

1. *N. Temperate Spots.*—A dark projection or shoulder observed at the S. edge of the N. Temperate Belt exhibited the same rapid motion as the remarkable series of objects which appeared on the S. side of the belt in 1880, and in 1891 and the following year as already mentioned in the introduction on pp. 63, 64. At the same time the spots observed close to the N. edge of the belt showed the very long rotation period of $9^h\ 56^m$, so that there was a difference of about 7 minutes in the periods of objects at the two edges of the belt separated by only a few degrees in latitude. This corresponds to a difference in relative linear velocity of about 300 miles per hour.

It has, of course, long been known that the region about the N. Temperate Belt shows from time to time both the swiftest and slowest of all the Jovian surface currents,* but whereas it appears that objects on the N. side of the belt always possess a long rotation period the swiftly moving spots on the S. side have commonly been considered abnormal. The outbreak of a considerable number of spots in this latitude in the autumn of 1929 (to the swift motion of which Mr. A. S. Williams was the first to draw attention) suggested that they might represent a really permanent current, though one which is only occasionally recorded in consequence of the paucity of markings definite enough for systematic observation. The subsequent detection of the rapid motion of the object of 1926 during the work of preparing this Memoir tends to strengthen the idea. Unfortunately, further search through the observations of former apparitions has so far failed to unearth any additional evidence on the point, as, although spots at the S. edge of the belt have been seen occasionally, the recorded transits are too few and scattered to be of any value for the determination of rotation periods. It is of great importance, therefore, that in future observers should pay close attention to this region with a view to settling the question of the permanence or otherwise of this extremely rapid local drift sometimes recorded.

In the event of its permanence being established, it is certainly remarkable that the swiftest surface current should not be at the Equator, as on the Sun, but in about N. latitude 25°; that it should be limited to so narrow a region; and should have in

* Considerably longer rotation periods than any recorded of N. Temperate Spots were shown by spots in the latitude of the S. Edge of the S. Equatorial Belt in 1919-20 (Twenty-second Report of the Section) and in 1928 (*M.N. R.A.S.* 89, 209), but they appear to have been quite exceptional.

such close contiguity on its N. side the slowest of all the permanent surface currents of which we have knowledge.

In view of the importance of this matter it seems desirable that the observations of the rapidly moving object at the S. edge of the belt in 1926 should be given in detail. Altogether only 13 observations of spots in this latitude are to hand. Three of them clearly cannot relate to the same spot. The last one, secured by A. S. Williams on October 30, at $\omega_1 = 355°$, might do so if the motion of the object had become accelerated, but the remaining nine settle the question of identity beyond all reasonable doubt.

DARK PROJECTION OR SHOULDER AT S. EDGE OF N. TEMPERATE BELT.

Time of Central Meridian Transit.				Longitude (System I).	Observer.	Remarks.
	d	h	m	°		
June	15	14	55	292·6	Phillips	Deduced from drawing
July	30	15	15	215·1	,,	
Aug.	4	13	7	207·3	,,	Deduced from drawing
,,	9	10	45	191·0	,,	Estimated when close to c.m.
,,	18	10	40	170·7	,,	
,,	27	10	49	157·8	,,	
,,	29	11	47	149·2	Peek	
Sept.	19	8	25	103·1	Phillips	Estimated when near c.m.
,,	21	9	38	103·5	,,	,, ,,

Owing to the long interval between the first and second observations and the uncertainty as to the transit time, the Rotation Period ($9^h\ 49^m\ 3^s$) has been computed for the interval July 30 to September 21 only.

2. *N. Tropical Spots.*—The revival of activity in this region was accompanied by a return to about the normal rate of drift observed from 1914 to 1920-21 which had been interrupted by a swifter motion in 1922 and 1923.

3. *N. Equatorial Spots.*—The increased period of these spots which had set in during the previous apparition was maintained. The observations were quite numerous, and, as will be seen from the Table on p. 72, the spots differed amongst themselves in their rate of motion to a smaller extent than is often the case.

4. *Red Spot.*—The Red Spot showed a retardation of about 3^s per rotation as compared with the figures for 1925.

In column 2 of the following Tables D=dark, W=white. In column 3 the inclusion of figures in brackets indicates that the spot was not observed (or did not exist) about the time of

opposition. The opposition longitude is inferred from the previous or subsequent motion of the object. The figures in column 6 are given to facilitate, when taken in conjunction with those in column 3, the possible identification of objects in successive apparitions.

N.N. TEMPERATE SPOT.

No.	Description.	Longitude at δ ω_2 °	Limiting Dates.	No. of Observations.	Approx. Change of Longitude in 30 days. °	Rotation Period. h m s
—	ρ end of dark part of belt	300	July 30–Aug. 26	4	+ 5	9 55 47·5

N. TEMPERATE SPOTS CLOSE TO N. EDGE OF N. TEMPERATE BELT.

			ω_2 °			°		
1	D	- -	60	June 3–Sept. 28	14	+ 16·0	9 56	2·5
2	D	- -	297	Aug. 14–Nov. 5	7	+ 14·5	9 56	0·5
3	W	- -	306	Aug. 4–Nov. 5	8	+ 16·7	9 56	3·5

Mean Rotation Period = 9h 56m 2s·2.

N. TEMPERATE SPOT AT S. EDGE OF N. TEMPERATE BELT.

			ω_1 °			°		
—	D	- -	180	June 13–Sept. 21	9	— 64·7	9 49	3·0

N. TROPICAL SPOTS.

			ω_2 °			°		
1	D	- -	165	July 13–Sept. 21	8	— 3·7	9 55	35·6
2	W	- -	178	July 13–Sept. 4	15	— 3·3	9 55	36·1
3	D	- -	188	July 20–Sept. 21	17	— 3·3	9 55	36·1
4	W	- -	248	July 30–Oct. 23	10	— 10·3	9 55	26·5
5	W	- -	254	July 12–Nov. 14	10	— 7·8	9 55	30·0
6	D	- -	267	July 12–Oct. 1	12	— 6·7	9 55	31·5
7	W	- -	334	Aug. 14–Dec. 16	7	— 7·3	9 55	30·6
8	D	- -	344	Aug. 14–Dec. 16	8	— 7·3	9 55	30·6

Mean Rotation Period = 9h 55m 32s·1.

N. EQUATORIAL SPOTS.

No.	Description.	Longitude at δ	Limiting Dates.	No. of Observations.	Approx. Change of Longitude in 30 days.	Rotation Period.
		ω_1 °			°	h m s
1	D - -	10	July 11–Dec. 24	9	— 4·2	9 50 24·3
2	W - -	24	July 9–Dec. 15	7	— 4·2	9 50 24·3
3	D - -	36	July 11–Dec. 24	14	— 5·0	9 50 23·3
4	W - -	47	July 11–Oct. 9	10	— 4·5	9 50 23·9
5	D - -	60	July 30–Oct. 23	14	— 5·5	9 50 22·6
6	W - -	71	July 30–Oct. 23	10	— 5·7	9 50 22·3
7	D - -	85	June 5–Oct. 7	19	— 6·0	9 50 21·9
8	W - -	97	July 9–Sept. 28	13	— 8·2	9 50 19·0
9	D - -	116	July 9–Nov. 14	17	— 6·3	9 50 21·5
10	W - -	126	July 12–Nov. 14	12	— 7·2	9 50 20·3
11	D - -	(136)	Aug. 29–Oct. 31	7	— 3·0	9 50 26·0
12	D - -	156	July 12–Oct. 31	11	— 2·0	9 50 27·3
13	W - -	176	July 26–Sept. 21	11	— 6 3	9 50 21·5
14	D - -	187	July 30–Sept. 22	10	— 3·0	9 50 26·0
15	D - -	(204)	July 15–Aug. 9	6	— 1·0	9 50 28·7
16	W - -	205	July 15–Nov. 5	17	— 6·5	9 50 21·3
17	D - -	217	July 15–Nov. 5	22	— 7·2	9 50 20·3
18	W - -	228	July 26–Nov. 5	13	— 6·7	9 50 21·0
19	D - -	240	July 29–Nov. 5	15	— 7·8	9 50 19·5
20	W - -	248	July 29–Nov. 5	13	— 7·8	9 50 19·5
21	D - -	260	July 20–Oct. 1	19	— 4·2	9 50 24·3
22	W - -	274	June 13–Sept. 13	9	— 5·5	9 50 22·6
23	D - -	288	June 13–Sept. 27	17	— 4·0	9 50 24·6
24	W - -	304	July 29–Sept. 13	7	— 4·0	9 50 24 6
25	D - -	313	Aug. 10–Oct. 9	10	— 2·8	9 50 26·2
26	W - -	326	July 20–Oct. 9	10	— 4·8	9 50 23·5
27	D - -	347	July 20–Oct. 9	10	— 4·8	9 50 23·5
28	W - -	356	July 20–Oct. 9	9	— 4·0	9 50 24·6

Mean Rotation Period = 9h 50m 23s·2.

REMNANTS OF S. COMPONENT OF S. EQUATORIAL BELT.

		ω_2 °			°	
1	"Remnant"	143	July 20–Sept. 28	13	+ 0·7	9 55 41·6
2	"Fragment"	224	July 20–Nov. 28	21	— 2·2	9 55 37·0

Mean Rotation Period = 9h 55m 39s·3.

THE RED SPOT.

		ω_2 °			°	
—	Centre -	21	July 9–Nov. 5	22	— 3·0	9 55 36·5

S. TEMPERATE SPOTS.

No.	Description.	Longitude at ω_2	Limiting Dates.	No. of Observations.	Approx. Change of Longitude in 30 days.	Rotation Period.
		°			°	h m s
1	W - -	352	July 16–Nov. 5	4	— 12·3	9 55 23·8
2	*p* end of dark part of belt	356	June 12–Dec. 16	16	— 13·0	9 55 22·8
3	D condensation	20	June 12–Nov. 19	11	— 13·7	9 55 21·9
4	*f* end of dark part of belt	192	July 20–Dec. 15	19	— 11·0	9 55 25·6
5	W - -	198	July 20–Aug. 26	10	— 9·0	9 55 28·3
6	D - -	230	July 30–Sept. 21	5	— 15·0	9 55 20·1
7	D - -	286	July 9–Oct. 26	16	— 15·5	9 55 19·4

Mean Rotation Period = 9h 55m 23s·1.

S.S. TEMPERATE SPOTS.

		ω_2				
		°			°	h m s
1	D - -	(41)	Aug. 22–Oct. 2	5	— 20·3	9 55 12·8
2	D - -	190	July 20–Sept. 4	6	— 22·0	9 55 10·5
3	W - -	(292)	July 9–Aug. 4	3	— 28·7	9 55 1·3
4	D - -	303	July 9–Oct. 26	11	— 23·2	9 55 8·9

Mean Rotation Period = $9^h\ 55^m\ 8^s\cdot4$.

SUMMARY.

Current.	1923.		1924.		1925.		1926.	
	Rotation Period.	No. of Objects.	Rotation Period.	No. of Objects.	Rotation Period.	No. of Objects.	Rotation Period.	No. of Objects.
	h m s		h m s		h m s		h m s	
N. Polar Spots	—	—	—	—	—	—	—	—
N.N. Temp. Spots	—	—	—	—	9 55 46·1	1	9 55 47·5	1
N. Temp. Spots	—	—	—	—	—	—	9 56 2·2 9 49 3·0	3 1 *
N. Trop. Spots	9 55 23·5	4	—	—	—	—	9 55 32·1	8
N. Equat. Spots	9 50 9·7	10	9 50 12·9	8	9 50 21·3	8	9 50 23·2	28
S. Equat. Spots	9 50 48·1	4	—	—	9 50 26·6	1	—	—
Spots in S.E.B.	—	—	—	—	—	—	9 55 39·3	2 †
Red Spot or Hollow	9 55 36·8	3	9 55 32·4	3	9 55 33·4	1	9 55 36·5	1
S. Trop. Dist.	9 55 31·7	1	9 55 37·4	3	9 55 36·4	2	—	—
Other S. Trop. Objects	—	—	—	—	9 55 49·7	1	—	—
S. Temp. Spots	9 55 14·3	4	—	—	9 55 22·6	3	9 55 23·1	7
S.S. Temp. Spots	9 55 7·8	1	—	—	9 55 8·1	4	9 55 8·4	4
S. Polar Spots	—	—	—	—	—	—	—	—

* See pp. 69–71. † Remnants of S. component of belt.

SATELLITE OBSERVATIONS.

As already mentioned in the introduction the planes of the Satellite orbits passed through the Sun during the 1926 apparition, and Major A. E. Levin, Director of the Computing Section, published in the JOURNAL (Vol. XXXVI, Nos. 5, 6 and 7) predicted times for the resulting mutual eclipses of the Satellites. This was of great assistance to observers and although weather conditions often interfered, some of these phenomena were observed.

In addition to the observations sent to the Director and given below there were others communicated to Major Levin direct, viz., from MM. J. van der Bilt, C. L. Brook, W. M. Lindley, L. Richardson, M. de Saussure, and C. S. Saxton. The last of the eclipses (September 20) was observed by as many as seven observers, and a comparison of the light curves deduced from their respective observations is interesting. Some curious differences both in the deduced times of mid-eclipse and in the diminution of light—especially in the latter—come out, which it is not very easy to explain, but a full account and discussion of the observations with diagrams of the light curves will be found in Major Levin's paper in the JOURNAL, Vol. XXXVII, No. 4, p. 136. The diagrams are reproduced in Plate V.

A few other Satellite phenomena of interest are included in the following reports:—

OBSERVATIONS BY W. B. CROTCH.

September 12. *Penumbral Eclipse of IV by II.* Predicted semi-duration 6 minutes. Instrument used $2\frac{7}{8}$ in. O.G. Power 80, sky clear. Estimated diminution of light $0^m{\cdot}4$.

OBSERVATIONS BY B. M. PEEK.

May 22. *Eclipse of I by II.* Predicted time of mid-eclipse $15^h\ 55{\cdot}8^m$. Predicted semi-durations for eclipse in shadow and penumbra 6·5 and 4·7 minutes respectively. At beginning of observations I estimated as $0^m{\cdot}3 > II$.

Observed times:—

h	m	s	
15	51	30	Suspected diminution in light of I.
15	52	25	Diminution certain.
15	53	55	I became invisible.
15	58	23	I seen again.
15	59	23	I and II equal in brightness.
16	0	30	I certainly > II.

The time when the two satellites were first equal was not recorded. It must have been within a few seconds of the time when it was first noted that the light was certainly fading. Taking these times as the same we have $15^h\ 55^m\ 54^s$ for mid-eclipse. Local sunrise occurred at approximately $15^h\ 55^m$ and

as the sky was brightening rapidly it is fairly safe to assume that fully 10 seconds before the satellite was first seen at re-appearance its brightness was equal to that at the time when it was last seen at disappearance. On this assumption we have for time of mid-eclipse $15^h\ 56^m\ 4^s$. The mean of the two methods = $15^h\ 55^m\ 59^s$, that is, 0·2 minutes later than the predicted time.

June 16. *Eclipse of I by II.* Predicted maximum phase 0·05 at $12^h\ 50{\cdot}4^m$. Semi-durations of umbral and penumbral eclipse 1·0 and 3·2 minutes respectively.

Before beginning of eclipse I was estimated as $0^m{\cdot}35 >$ II, and after the eclipse was over as $0^m{\cdot}2$ or $0^m{\cdot}25 >$ II. Seeing of the worst possible kind. Planet very low and sky partially cloudy.

At no time did I become less bright than II (it was probably always $0^m{\cdot}1$ brighter), but it seems likely that there was a diminution of the light of I amounting to $0^m{\cdot}15$ or $0^m{\cdot}2$ at the predicted time. (See observations by the Director on p. 78.)

June 22. *Eclipse of III by II.* Predicted magnitude = 0·19 at $12^h\ 47{\cdot}8^m$. Semi-duration in umbra and penumbra 3·1 and 6·1 minutes respectively. Clouds very troublesome.

Impossible to estimate accurately the magnitude of I, II and III, which were close together, before the eclipse. Afterwards III was estimated as $0^m{\cdot}25 >$ I and $0^m{\cdot}3 >$ II.

The following observations relate to glimpses between clouds, and the magnitudes are consequently extremely unreliable:—

h	m	s	
12	44	3	III fainter than previously.
12	45	55	III judged just < II.
12	48	30	III = II.
12	50	0	III = 0·1 > II.
12	50	40	III = 0·2 > II.

There was an undoubted diminution in the light of III—probably of about $0^m{\cdot}4$ approximately at the predicted time.

June 28. *Eclipse of II by I.* Predicted as annular and of magnitude 0·48 at $11^h\ 47{\cdot}5^m$—Satellites moving in opposite directions and semi-durations for shadow and penumbra only 1·2 and 2·3 minutes respectively.

Before beginning of eclipse III appeared from $0^m{\cdot}8$ to a whole magnitude > II. I was in transit, and IV so close to commencing transit as to be almost invisible. At $11^h\ 46^m\ 15^s$ it was certain that II had begun to fade, and just after this it became very faint indeed. At $11^h\ 47^m\ 10^s$ II was undoubtedly growing brighter again. The minimum of light must have occurred at about $11^h\ 46^m\ 45^s$ or three-quarters of a minute earlier than the predicted time. The observations may have been partly affected by cloud, but there was certainly no further

diminution of light after the time given. It is not possible to say what the decrease of magnitude was, but it was considerable.

The faintness of IV.—" The faintness of IV just before the commencement of transit was remarkable. During the whole of the time I was at the telescope IV was an extremely difficult object to see at all."

August 4. *Eclipse of III by II.* Predicted as penumbral only. Maximum at $9^h\ 28{\cdot}4^m$. Semi-duration = 3·9 minutes. Before and after the predicted time III was estimated as $0^m{\cdot}3 >$ I and $0^m{\cdot}4$ or $0^m{\cdot}5 >$ II.

No certain diminution of light observed, but at about $9^h\ 27{\cdot}5^m$ to $9^h\ 28{\cdot}0^m$ III was suspected of being somewhat fainter, say, $0^m{\cdot}1 >$ I. It was never $<$ I. Seeing very bad with planet so low, and 2-in. finder of the 6-in. refractor best for magnitude estimates.

August 9. *Eclipse of IV by I.* Predicted as penumbral only at $13^h\ 52{\cdot}9^m$. Semi-duration = 1·7 minute. No certain fading of IV observed.

August 14. *Transit of III and Shadow.* " At commencement of transit III seemed to be in contact with its shadow and was, of course, seen bright. Near the centre of the disc, however, and in fact during most of the transit the satellite was grey, looking rather like a southward projection from the N. component of S.E.B.; it then appeared somewhat elliptical, with P.A. as shown in rough diagram,* and not to be quite in contact with the shadow, though its true limb may have been invisible and touching."

August 15. *Transit of II and Shadow.* " Satellite II transited and must, I think, have occulted part of its own shadow, but I did not observe the ingress and never saw the satellite for certain on the disc. The shadow appeared very small, but seeing was not good enough to show any definition."

August 17. *Very dark transit of IV.* The satellite appeared small but quite as black as its shadow in the 6 in. Definition poor to moderate. The darkness was the more remarkable as more than half of the satellite lay on the N. component of the S.E.B.

September 12. *Eclipse of IV by II.* Penumbral only. Predicted as occurring at $9^h\ 50{\cdot}3^m$. Semi-duration = 6·0 minutes. " Nothing more observed than a faintly suspected fading. No diminution of light that one could be sure of."

September 19. *Very dark transit of III.* It was not seen bright until it had begun to project at egress.

September 27. " Shadow of II very difficult to see with 6-in. between $18\frac{1}{2}$ and 19 hrs. Seeing was admittedly bad, but the

* P.A. approximately 50° relatively to the axis of Jupiter.

shadow when seen at all seemed like a very pale brownish-grey spot. It was just projecting to the N. of the N. component of the S. Equatorial Belt."

OBSERVATIONS BY F. SARGENT.

September 20. *Eclipse of II by IV.* Computed time for mid-eclipse = $8^h\ 54{\cdot}8^m$. Magnitude = 0·60. Semi-durations in shadow and penumbra 10 and 19 minutes respectively.

"Prior to the event Sat. IV was estimated as about $0^m{\cdot}2 <$ II. No change apparent at $8^h\ 39^m$.

h	m		
At 8	46	II perceptibly failing and = IV.	
„ 8	50	II about $0^m{\cdot}2 <$ IV.	
„ 8	53	II about $0^m{\cdot}75 <$ IV.	
„ 8	55	Difference very great; suggest a full magnitude.	
„ 8	57	? rising.	
„ 8	59	Certainly up grade but slow.	
„ 9	1	II approaching equality with IV.	
„ 9	2·5	II = IV.	
„ 9	3·5	Suggest that normality was reached, and II = $0^m{\cdot}2 >$ IV.	

At $8^h\ 55^m$ a 1-in. stop was placed over the (5 in.) O.G. Satellite seen, but hardly easy or obvious. The presence of strong moonlight must be noted."

OBSERVATIONS BY A. S. WILLIAMS.

September 20. *Eclipse of II by IV.* The observers made by the method of Argelander. The observer's natural step value is about $0^m{\cdot}05$. The times as observed were subject to a correction of + 2·4 minutes, and the fact that they were recorded with nearest minute accounts for the predominance of the decimal 4. The sky was fairly clear apart from haze between $8^h\ 45^m$ and $8^h\ 52^m$.

h	m				
At 8	8·4	II	4	IV	
	22·4	II	5	IV	
	31·4	II	5	IV	
	43·4	II	6	IV	haze
	47·9	II	1	IV	„
	49·4	IV	4	II	„
	50·4	IV	7	II	„
	51·4	IV	10	II	„
	52·1	IV	12	II	„
	53·4	IV	15	II	
	54·9	IV	18	II	
	55·9	IV	20	II	
	57·4	IV	20	II	

h	m				
At 8	58·4	IV	19	II	
	59·4	IV	16	II	
9	0·4	IV	12	II	
	1·4	IV	8	II	
	1·9	IV	6	II	
	2·9	IV	3	II	
	4·1	IV	0	II	good
	4·6	II	0	IV	
	6·4	II	4	IV	
	7·4	II	5	IV	
	9·9	II	5	IV	
	13·7	II	6	IV	
	16·4	II	5	IV	
	19·4	II	5	IV	

OBSERVATIONS BY THE DIRECTOR.

June 16. *Partial Eclipse of I by II.* Predicted time $=12^h\ 50{\cdot}4^m$. Magnitude = 0·05 diameter. Semi-duration in shadow = 1·0 minute; in penumbra = 3·2 minutes.

Planet very low. Image rather dim through haze and too blurred for use of higher power than 211.

Before eclipse I estimated to be $0^m{\cdot}3$ to $0^m{\cdot}4$ (say $0^m{\cdot}35$) > II.

At	12 48·5	±	I estimated = II + 0·3	
,,	12 50·5	±	,, ,, = II + 0·05	I just a shade the brighter
,,	12 53	±	,, ,, = II + 0·3	
,,	12 53·5		,, ,, = II + 0·35 ±	Original brightness

August 4. *Penumbral Eclipse of III by II.* Predicted time of maximum $9^h\ 38^m$. 8-in. refractor used by R. L. Waterfield, 12¼-in. reflector used by T. E. R. Phillips. "Neither of us could be sure that there was any diminution in the brightness of III."

August 14. *Transit of III and Shadow.* Shadow transited N. component of S.E.B. with the satellite *sf*. "Seeing scarcely good enough for me to be certain whether or not the shadow was just slightly occulted, but I think not." (*See* Peek's observation above.)

August 15. *Transit of II and Shadow.* "The shadow was partly occulted. I am inclined to put the maximum at 0·2 diameter."

October 23. *Partial Occultation of I by IV.* "Seeing poor, and clouds passing at times. IV slightly further south than I which looked considerably larger, probably because of its greatly superior brightness. Perhaps at greatest phase ⅓ to ½ the diameter of I was occulted.

The first and last contacts were considered to occur at $8^h\ 58^m$ and $9^h\ 18^m$ respectively, but these times are not very reliable—particularly that of last contact—owing to the wretched seeing and the appearance of cloud at that moment.

I estimated from the apparent P.A. of the major axis of the combined images that the middle of the phenomenon occurred about $8^h\ 7^m$."

NOTES ON THE LATITUDES OF THE BELTS.

It may be convenient to collect and discuss here the latitude measures of the belts made by the Director during the 20 apparitions from 1908-09 to 1929-30 (inclusive). Measures were also made by the late Mr. Scriven Bolton during the apparitions of 1907-08 and 1908-09 (13th and 14th Reports of the Section), by the late Rev. A. Thomas G. Apple in 1914 (18th Report) by Mr. Harold Thomson in 1917-18 (20th Report), and by Mr. B. M. Peek in 1923 and 1924 (24th Report). These are in general in good agreement, but for the purpose of comparing the relative movements and changes in the belts in successive years those presented in the Table on p. 81 have the advantage of having been made by the same observer and with the same instrument (a Cooke 8-in. refractor), except that for those of 1908-09, 1909-10 and 1911 a 12¼-in. Calver reflector was used.

The deduced latitudes for each apparition are accompanied by a column containing their deviations from the mean values as given at the foot of the Table. In the measurements of the often irregular edges of the Equatorial Belts the *mean* edge has been measured.

The points which stand out clearly on inspection of the series of measures are the following:—

(1) The general constancy in position of the S. Equatorial and S. Temperate Belts; their mean deviations being less than 1°.

(2) The variations in position of the N. edge of the N. Equatorial Belt; the deviations exceeding 3° on no less than seven occasions for which figures are given, and nine occasions counting in 1911 and 1912. The belt was extremely narrow in the latter year, and perhaps the S. component was alone visible.

The deviations in the latitude of the S. edge of the belt are not large, but it is interesting to tabulate the changes in the width of the belt shown by the measures of the two edges in successive years, compared with the corresponding figures for the S. Equatorial Belt.

WIDTH OF THE EQUATORIAL BELTS.

Apparition.	N.E.B.	S.E.B.	Apparition.	N.E.B.	S.E.B.
	°	°		°	°
1908–09	11·6	12·3	1919–20	10·7	13·7
1909–10	5·8	10·1	1920–21	6·6	12·0
1911	Rather narrow	8·6	1922	14.5	11·9
1912	Very narrow	8·7	1923	13·0	12·3
1913	12·3	10·5	1924	11·6	11·4
1914	10·6	10·6	1925	7·5	10·9
1915	10·5	11·5	1926	7·8	—
1916–17	9·3	12·1	1927–28	11·3	—
1917–18	6·6	10·9	1928–29	11·3	8·5
1918–19	11·8	11·2	1929–30	9·3	11·7

Several years ago the late Prof. G. W. Hough published diagrammatically (*Pop. Astr.*, No. 121, 1905, Jan.) the results of his measures of the Equatorial Belts from 1895 to 1904. Like the present series these show large and rapid variations in the width of the N. Equatorial Belt, while the changes in the S. Equatorial Belt were small. The N. Equatorial Belt was narrow in 1896, 1898, 1901, and again in 1903 and 1904—particularly in 1896 and 1901. It was wide in 1897, 1899 and 1900 and again in 1902. Considerable drift in latitude was, however, shown by both N. and S. edges, whereas from 1908-09 to the present time the variations in width have been almost entirely due to changes in the position of the N. edge only.

During the interval between the two series of observations here referred to the N. Equatorial Belt was narrow and very faint—scarcely distinguishable from the slaty shading of the Equatorial Zone—in 1905-06, very broad in 1906-07, and still broad in 1907-08.

As regards the S. Equatorial Belt it must be remarked that, despite the general constancy in width to which attention has been drawn, there have been two occasions on which all but the N. portion has disappeared, viz., in 1919 after the measures of 1918-19 had been made and before the great revival of 1919-20, and again in 1926. But in both these instances the changed aspect of the belt was definitely not due to any drift in latitude of the S. edge, for remnants of the S. component were visible during the fading process in the old position for some time before the disappearance was complete (21st and the present Reports).

(3) The N. Temperate Belt has presented considerable variations in latitude. It will be of interest to note in the future whether or not any relationship can be traced between the position of the belt and the remarkable rates of motion indicated from time to time by N. Temperate spots.

(4) The N.N. Temperate Belt has been systematically situated in lower latitude than the corresponding belt in the S. hemisphere.

Apparition.	N. P. R. S. Edge.		N. N. T. B.		N. T. B.		N. E. B. N. Edge.		N. E. B. S. Edge.		S. E. B. N. Edge.		S. E. B. S. Edge.		S. T. B.		S.S. T. B.		S. P. R. N. Edge.	
	Zen. lat.	Dev.	Zen. lat.	Dev.	Zen. lat.	Dev.	Zen. lat.	Dev.	Zen. lat.	Dev.	Zen. lat.	Dev.	Zen. lat.	Dev.	Zen. lat.	Dev.	Zen. lat.	Dev.	Zen. lat.	Dev.
	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°
1908 09 .	N. 50·2	+1·0	N. 36.4	−1·2	N. —	—	N. 20·4	+3·1	N. 8·8	+1·6	S. 7·3	0·0	S. 19·6	+1·2	S. 29·8	+1·0	S. 41·6	+0·1	—	—
1909-10 ..	49·4	+0·2	42·4	+4·8	24·5	−3·1	14·0	−3·3	8·2	+1·0	9·0	+1·7	19·1	+0,7	29·1	+0·3	41·7	+0·2	—	—
1911.. ..	—	—	—	—	29·3	+1·7	Centre of belt at +11°·9				7·5	+0·2	16·4	−2·0	29·2	+0·4	44·5	+3·0	S. 57·4	—
1912.. ..	—	—	—	—	28·7	+1·1	Centre of belt at +8°·3 Belt narrow and faint				8·5	+1·2	17·2	−1·2	30·1	+1·3	—	—	—	—
1913.. ..	—	—	38·2	+0·6	—	—	20·2	+2·9	7·9	+0·7	8·7	+1·4	19·2	+0·8	30·4	+1·6	—	—	—	—
1914.. ..	48·5	−0·7	37·3	−0·3	30·4	+2·8	19·3	+2·0	8·7	+1·5	8·9	+1·6	19·5	+1·1	29·5	+0·7	39·0	−2·5	—	—
1915.. ..	—	—	38·8	+1·2	26·4	−1·2	18·0	+0·7	7·5	+0·3	8·3	+1·0	19·8	+1·4	29·3	+0·5	43·5	+2·0	—	—
1916-17 ..	48·5	−0·7	36·9	−0·7	25·8	−1·8	17·1	−0·2	7·8	+0·6	7·2	−0·1	19·3	+0·9	27·5	−1·3	38·7	−2·8	—	—
1917-18 ..	53·0	+3·8	38·5	+0·9	26·0	−1·6	13·0	−4·3	6·4	−0·8	7·6	+0·3	18·5	+0·1	27·2	−1·6	39·6	−1·9	—	—
1918-19 ..	—	—	37·4	−0·2	28·0	+0·4	18·8	+1·5	7·0	−0·2	6·5	−0·8	17·7	−0·7	27·8	−1·0	41·1	−0·4	—	—
1919-20 ..	—	—	39·5	+1·9	29·3	+1·7	18·7	+1·4	8·0	+0·8	4·4	−2·9	18·1	−0·3	27·7	−1·1	42·0	+0·5	—	—
1920-21 ..	45·7	−3·5	33·1	−4·5	27·6	0·0	12·7	−4·6	6·1	−1·1	7·2	−0·1	19·2	+0·8	28·5	−0·3	40·0	−1·5	—	—
1922.. ..	—	—	—	—	31·2	+3·6	22·0	+4.7	7·5	+0·3	6·3	−1·0	18·2	−0·2	27·0	−1·8	39·8	−1·7	—	—
1923† ..	—	—	—	—	28·8	+1·2	19·2	+1·9	6·2	−1·0	6·6	−0·7	18·9	+0·5	29·4	+0·6	—	—	—	—
1924.. ..	—	—	—	—	30·8	+3·2	16·6	−0·7	5·0	−2·2	6·5	−0·8	17·9	−0·5	28·3	−0·5	44·2	+2·7	—	—
1925.. ..	—	—	—	—	28·5	+0·9	13·4	−3·9	6·1	−1·1	7·4	+0·1	18·3	−0·1	29·5	+0·7	44·1	+2·6	—	—
1926.. ..	—	—	—	—	25·1	−2·5	13·9	−3·4	6·1	−1·1	(9·5)*	—	—	—	28·7	−0·1	40·7	−0·8	—	—
1927-28 ..	—	—	34·7	−2·9	25·0	−2·6	17·5	+0·2	6·2	−1.0	(8·8)*	—	—	—	29·1	+0·3	—	—	—	—
1928-29 ..	—	—	37·0	−0·6	25·4	−2·2	19·8	+2·5	8·6	+1·4	8·7	+1·5	17·2	−1·2	28·5	−0·3	—	—	—	—
1929-30 ..	—	—	38·4	+0·8	25·2	−2·4	16·6	−0·7	7·3	+0·1	5·9	−1·4	17·6	−0·8	28·5	−0·3	41·3	−0·2	—	—
Means ..	49·2	±1·7	37·6	±1·6	27·6	±1·9	17·3	±2·4	7·2	±0·9	7·3	±1·0	18·4	±0·7	28·8	±0·8	41·5	±1·5	—	—

*Centre of N. component of belt.

† The figures for this apparition differ slightly from those given on p. 12 of Report XXIV of the Section, a set of measures on 1923 Feb. 8 having been inadvertently overlooked during the preparation of that Report.

DRIFT OF THE BELTS IN LATITUDE.

In connection with the analogy often drawn between the Jovian belts and the spot-zones on the Sun the question arises as to whether the former, like the latter, show any systematic or periodic motion in latitude. This can be judged most easily when the measures are plotted in chart form, and the Director's figures for the N. and S. Temperate and the two Equatorial belts, as well as those for the Red Spot are thus presented in the accompanying diagram.

The deduced positions for belts in higher latitudes are necessarily more sensitive to inevitable errors of measurement, and as, in addition, two or more belts are frequently observed close together in those regions of the disc and correct identification is liable to occasional uncertainty, it did not seem worth while to include them in the chart.

Broadly speaking, it does not appear that any very definite answer to the question proposed is indicated. If there be any systematic change in the latitudes it is largely masked by irregularities—particularly in the N. hemisphere. But on the available evidence, the following points are, perhaps, worth noting:—

(1) The features in the S. hemisphere all show an *approach* to the equator near the middle apparitions of the chart. The time of minimum latitude, however, is not quite the same for all, but appears progressively later from the S. Temperate Belt to the N. edge of the S. Equatorial Belt. In the N. hemisphere a general motion towards the Equator about the middle apparitions of the chart is much more doubtful. A greatly smoothed curve of the centre of the N. Equatorial Belt perhaps suggests it, and the N. Temperate Belt was clearly much nearer the Equator about 1917 (and again about 1928) than during most other apparations.

(2) As regards the question of periodic *recession* from the Equator, the S. Temperate Belt shows maxima about 1913 and 1925. In the curves of the S. Equatorial Belt there is a striking dip about 1911 which throws the maximum displacement S. to about 1914 or even later, while, owing to the disappearance of the S. component of the belt after the 1925 apparition, the maximum following the 1918 minimum cannot be determined. (The apparent short maximum of 1920-21 is perhaps unreal—see note 4 below). But the Red Spot curve shows well-defined maxima about 1912 and 1925 in good agreement with that of the S. Temperate Belt.

In the N. hemisphere the N. Temperate Belt shows maximum displacement N. about 1913 and 1923, and the N. Equatorial Belt (smoothed curve of centre) about 1913, 1922 and 1928-9.

Unfortunately it seems impossible to get any really satisfactory periodicity out of these figures, though a suggestion of such a phenomenon is given by one or two of the belts, and, with

greater probability, by the Red Spot. Reference to Hough's measures leads to a similar conclusion. It may be that in the long run some fundamental oscillation which is often masked by large temporary fluctuations may be brought to light, but at present more can hardly be said than that a case has been made out for more systematic work in this particular field of Jovian research.

(3) In each hemisphere the direction of drift shown by contiguous features is commonly sympathetic, *e.g.*, the displacements of the N. Temperate Belt clearly have some relation to the extensions and recessions of the N. edge of the N. Equatorial Belt.

(4) It will be seen that the measures of all the belts in both hemispheres indicate a motion southwards during the apparition of 1920-21, suggesting some systematic error either in the measures or the reductions. The latter have been repeated, but the source of the error, if it exists, has not been traced.

THE RED SPOT.

No direct measures have been made of the latitude of the Red Spot. The object is often faint and sometimes invisible, but when seen distinctly it is usually in apparent contact with the S. Temperate Belt on its S. side, but well separated from the S. Equatorial Belt on its N. side, where it apparently repels the dark material of the belt and forms the familiar Bay or Hollow with a clear channel between them.* The Director's drawings of the spot and its surroundings go back to 1898, and of the 30 apparitions that have occurred since that date he finds the Red Spot represented as in contact with the S. Temperate Belt on as many as 22. On at least 14 of these the drawings show the belt and S. edge of the spot actually overlapping, apparently indicating that the two features are at different levels.

The position of the Red Spot on the Director's drawings has been measured and the results referred to the latitudes deduced from his micrometer measures of the S. Temperate Belt and the N. and S. edges of the S. Equatorial Belt. The Table below gives the *Zenographical* latitudes of the Red Spot in successive apparitions as thus derived. In this Table the letters *c* and *o* in column 2 denote Spot and S.T.B. in *contact* and *overlapping* respectively. The asterisk in column 3 indicates that the Red Spot was seen specially well defined though the available drawings are few in number. The weights in column 7 are based on a consideration of both the drawings and the micrometer measures. The other columns are self explanatory.

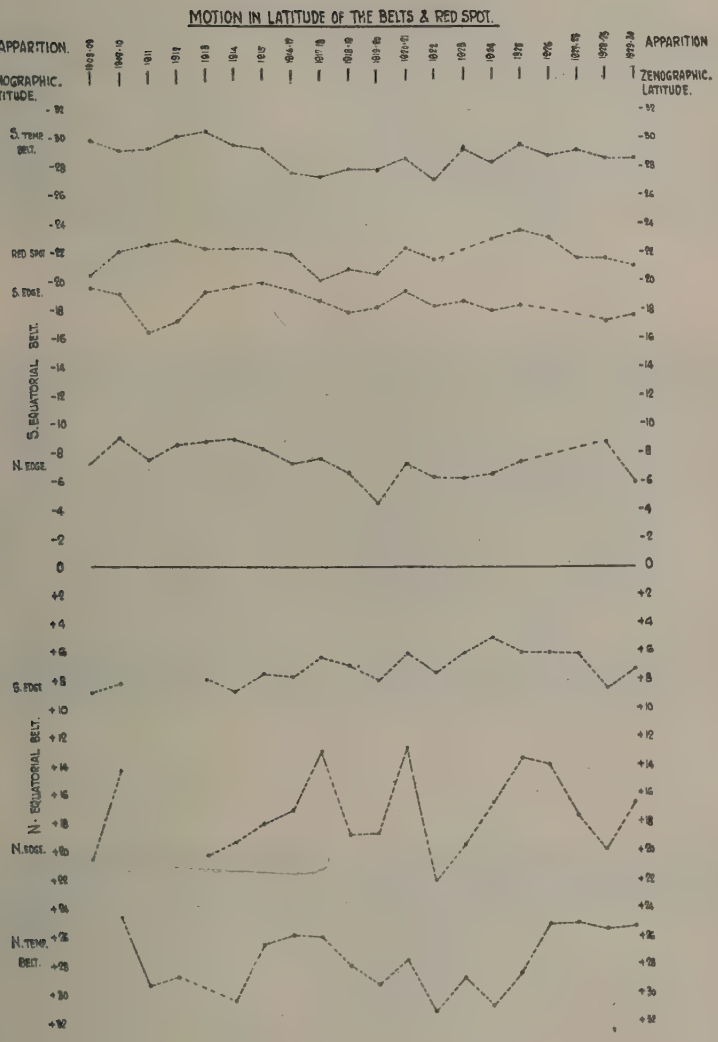
* During the apparition of 1908-09 this channel became extremely narrow and was at times invisible—probably owing to the encroachment of dusky material from the belt (see 14th Report).

THE RED SPOT.

Apparition	C or O	No. of Drawings utilized	No. of sets of Microm: measures	Deduced Zenograph: latitude	Deviation from mean	Weight	Remarks
				°	°		
1908–09	?C	4	7	S. 20·4	—1·4	5	Hollow shallower than in previous few years, and channel between R. S. & S. E. B partly obscured
1909–10	O	6	6	22·0	+0·2	5	Hollow shallow. Channel between R. S. & S. E. B clearing
1911	O	1	2	22·5	+0·7	1	Hollow shallow
1912	C	1*	2	22·8	+1·0	2	
1913	?	1	3	22·2	+0·4	1	
1914	O	2*	3	22·3	+0·5	3	
1915	?C	5	4	22·3	+0·5	5	
1916–17	?C	2	2	21·8	0·0	2	
1917–18	C	9	6	20·0	—1·8	5	
1918–19	C	5	3	20·8	—1·0	5	
1919–20	C	5	3	20·4	—1·4	5	
1920–21	O	3*	2	22·3	+0·5	4	
1922	O	1	2	21·4	—0·4	1	
1923	?C	0	3	—	—	—	Hollow shallow
1924	O	2*	3	22·9	+1·1	3	Hollow shallow
1925	O	3*	3	23·5	+1·7	4	Hollow very shallow
1926–27	O	5	2	23·0	+1·2	4	S. E. B_S and Hollow disappeared
1927–28	O	6	4	21·6	—0·2	4	Hollow invisible at first. Red Spot very conspicuous
1928–29	O	19	2	21·5	—0·3	4	Hollow reappeared
1929–30	?C	4	2	21·0	—0·8	2	

Mean Zenographical latitude of Red Spot = S. 21°·8.
Mean deviation from the mean value = ± 0°·8.

The figures in the above Table, as shown by the column of residuals, suggest an oscillation in a period of roughly a dozen years with maximum displacements in approximately 1912 and 1925 southwards, and in 1918 northwards. (*See*, too, the chart on p. 85.)


MOTION IN LATITUDE OF THE BELTS & RED SPOT.
APPARITION.
ZENOGRAPHIC. LATITUDE.
APPARITION
ZENOGRAPHIC. LATITUDE.
S. TEMP. BELT.
RED SPOT
S. EDGE.
S. EQUATORIAL BELT.
N. EDGE.
S. EDGE
N. EQUATORIAL BELT.
N. EDGE.
N. TEMP. BELT.

In an important paper in *Popular Astronomy*, No. 369 (1929 Nov.) under the title *On the cause of Jupiter's Belts*, W. A. Luby concludes that in consequence of precessional disturbance of the planet's rotation an object situated near the latitude of the Red Spot should show a N. and S. oscillation in the period of the planet's revolution, viz., in 11·86 years. He also quotes the latitude measures of the Red Spot by Hough between 1880 and 1903 (*Pop. Ast.*, No. 121, 1905 Jan.) as indicating such a motion. It is therefore of interest to compare these and the series of figures given above with Luby's deductions, and in the following Table will be found computed and observed dates of maximum displacement of the spot.

Maximum Displacement N.				Maximum Displacement S.			
Computed Date.	Observed Date.	O—C (approx.).	Observer.	Computed Date.	Observed Date.	O—C (approx.).	Observer.
		y				y	
1881·65	1880·5	−1·5	Hough	1887·85	1887	−1·0	Hough
1893·51	1894	+0·5	Hough	1899·71	1897·5	−1·0	Hough
1905·37	—	—	—	1911·57	1912·5	+1·0	Phillips
1917·23	1918·5	+1·0	Phillips	1923·43	1925	+1·5	Phillips
1929·09	See note below			1935·29	—	—	—

The Director's figures for the last three apparitions clearly indicate a motion of the spot Equatorwards, but it is not at present possible to say whether minimum latitude has yet been reached.

In view of the difficulty of determining the "observed" dates accurately the figures here given may perhaps be regarded as being in satisfactory agreement with the theory, but it will be noticed that Hough's epochs are in general *early* and those of the Director *late* as compared with the computed dates, the extreme range in the deviations between the first and last sets of figures being 2·5 years for both N. and S. displacements. So far as the evidence goes it appears to suggest a swing in latitude in a somewhat longer period than 11·86 years in agreement with A. S. Williams' recently revised period (12·5 years) of changes in the coloration of the two Equatorial belts (*M.N.R.A.S.* 90, p. 696 *et seq.*, 1930 May).

The matter is, however, at present extremely uncertain, and the importance of greater attention being given to latitude measures by observers is very strongly emphasised.

Published October 24, 1930.

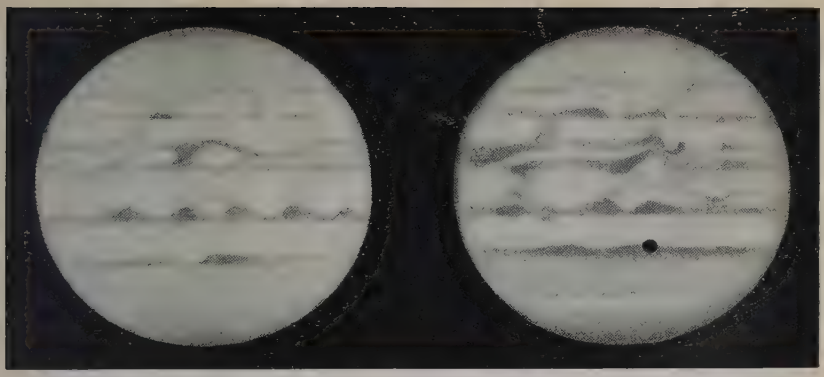


Figure 1. 1925 June 9^d 13^h 45^m
$\lambda_1 = 26^\circ$, $\lambda_2 = 73^\circ$
T. E. R. Phillips. 8-in. O.G.

Figure 2. 1925 June 10^d 12^h 25^m
$\lambda_1 = 135^\circ$, $\lambda_2 = 175^\circ$
T. E. R. Phillips. 8-in. O.G..
Shadow of III on disc.

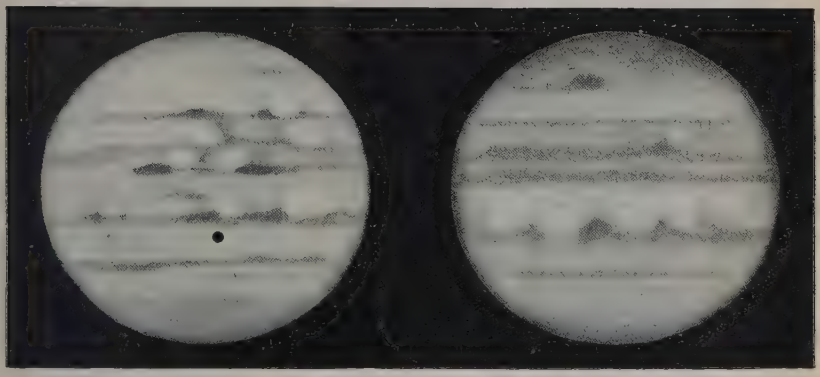


Figure 3. 1925 Aug. 7^d 9^h 15^m
$\lambda_1 = 184^\circ$, $\lambda_2 = 143^\circ$
T. E. R. Phillips. 8-in. O.G.
Shadow of II on disc.

Figure 4. 1925. Aug 13^d 8^h 20^m
$\lambda_1 = 18^\circ$, $\lambda_2 = 291^\circ$
B. M. Peek. $12\frac{1}{2}$-in. spec.

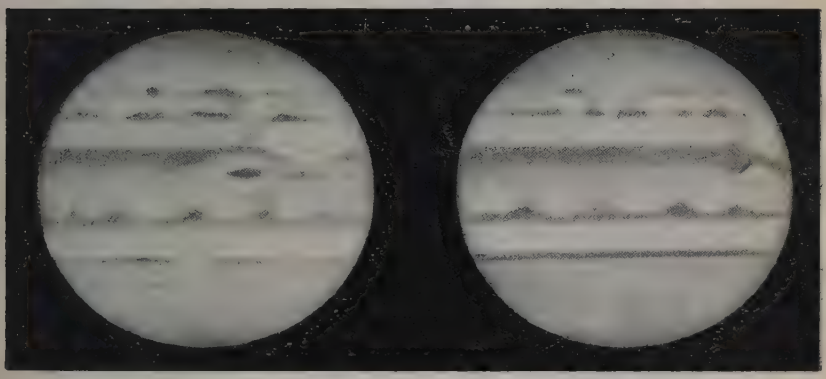


Figure 5. 1925 Aug. 16^d 8^h 55^m
$\lambda_1 = 153^\circ$, $\lambda_2 = 43^\circ$
T. E. R. Phillips. 8-in. O.G.

Figure 6. 1925 Sept. 14^d 7^h 15^m
$\lambda_1 = 350^\circ$, $\lambda_2 = 20^\circ$
T. E. R. Phillips. 8-in. O.G.

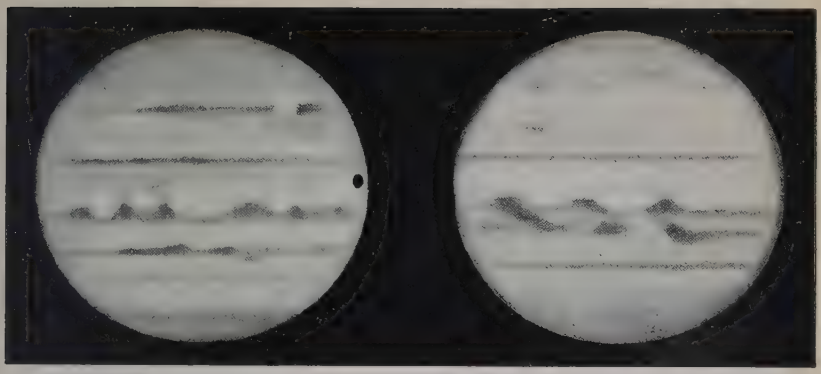


Figure 1. 1926 June 3^{d} 14^{h} 20^{m}
$\lambda_1 = 176^{\circ}$, $\lambda_2 = 3^{\circ}$
T. E. R. Phillips. 8-in. O.G.
Shadow of I on disc.

Figure 2. 1926 July 11^{d} 12^{h} 48^{m}
$\lambda_1 = 3^{\circ}$, $\lambda_2 = 262^{\circ}$
B. M. Peek. 12½-in. spec.

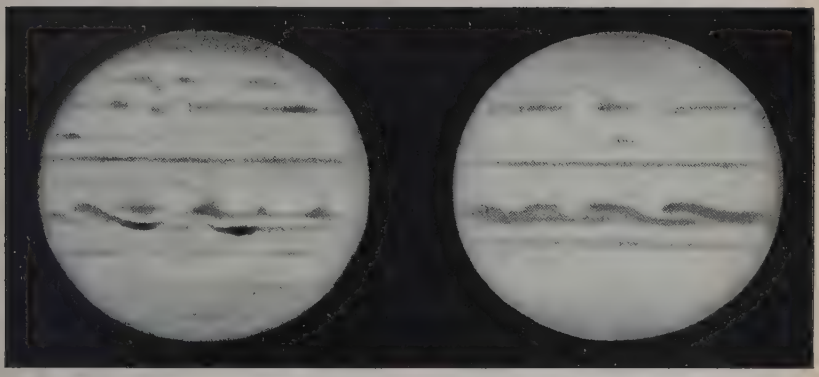


Figure 3. 1926 July 11^{d} 13^{h} 0^{m}
$\lambda_1 = 10^{\circ}$, $\lambda_2 = 269^{\circ}$
T. E. R. Phillips. 8-in. O.G.

Figure 4. 1926 July 13^{d} 13^{h} 30^{m}
$\lambda_1 = 345^{\circ}$, $\lambda_2 = 228^{\circ}$
F. J. Hargreaves. 6½-in. spec.

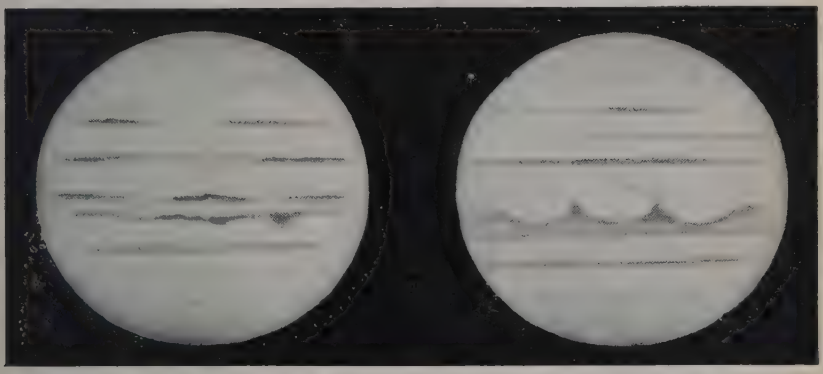


Figure 5. 1926 July 20^{d} 14^{h} 5^{m}
$\lambda_1 = 32^{\circ}$, $\lambda_2 = 224^{\circ}$
T. Brindley. 3-in. O.G.

Figure 6. 1926 July 31^{d} 11^{h} 24^{m}
$\lambda_1 = 251^{\circ}$, $\lambda_2 = 357^{\circ}$
F. Sargent. 5-in. O.G.

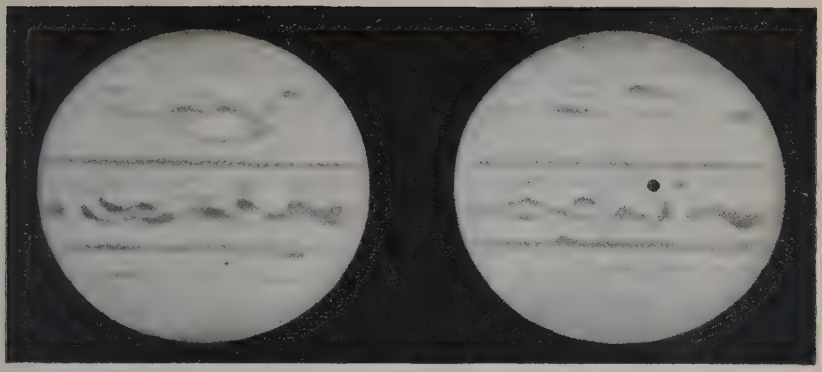


Figure 1. 1926 July 31^{d} 12^{h} 30^{m}
$\lambda_1 = 273^{\circ}$, $\lambda_2 = 19^{\circ}$
T. E. R. Phillips. 8-in. O.G..
Minute black spot on N. Temp. Z.

Figure 2. 1926 Aug. 4^{d} 13^{h} 45^{m}
$\lambda_1 = 230^{\circ}$, $\lambda_2 = 306^{\circ}$
T. E. R. Phillips. 8-in. O.G.
I in transit as a dusky spot following its shadow.

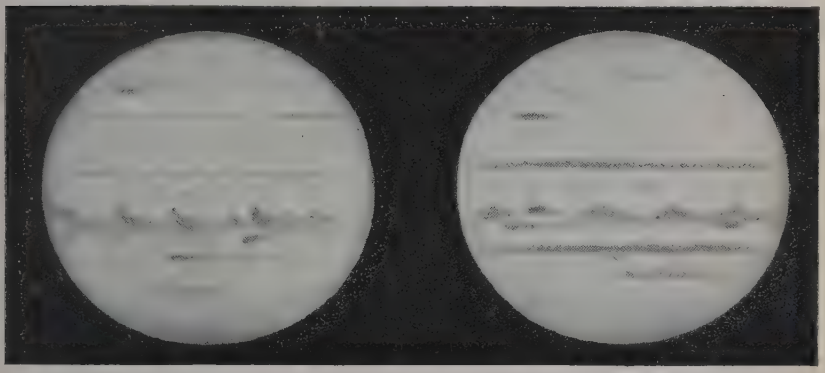


Figure 3. 1926 Aug. 24^{d} 1^{h} 55^{m}
$\lambda_1 = 47^{\circ}$, $\lambda_2 = 331^{\circ}$
B. M. Peek. 6-in. O.G.

Figure 4. 1926 Aug. 26^{d} 11^{h} 45^{m}
$\lambda_1 = 34^{\circ}$, $\lambda_2 = 302^{\circ}$
T. E. R. Phillips. 8 in. O.G.

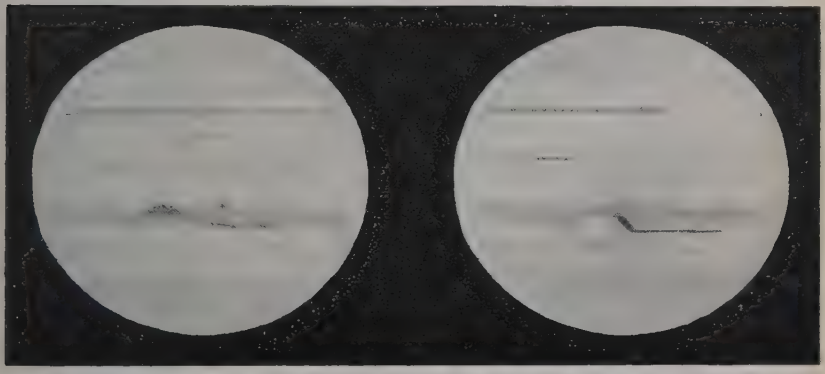


Figure 5. 1926 Aug. 30^{d} 22^{h} 50^{m}
$\lambda_1 = 272^{\circ}$, $\lambda_2 = 150^{\circ}$
M. A. Ainslie. 9-in. spec.

Figure 6. 1926 Sept. 4^{d} 22^{h} 46^{m}
$\lambda_1 = 340^{\circ}$, $\lambda_2 = 180^{\circ}$
M. A. Ainslie. 9-in. spec.

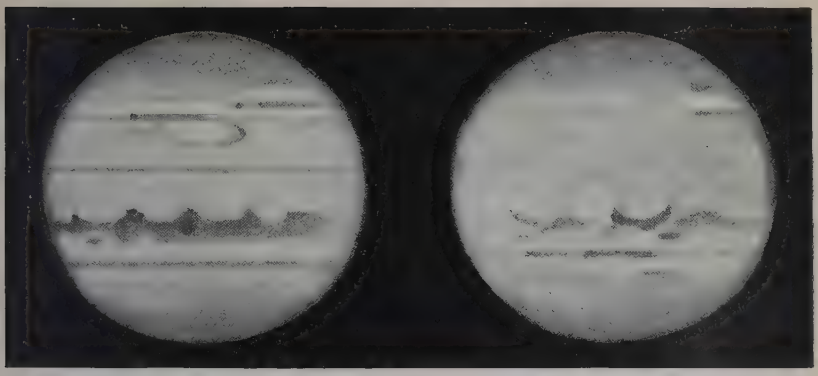


Figure 1. 1926 Sept. 7^d 9^h 45^m
$\lambda_1 = 215°$, $\lambda_2 = 24°$
B. M. Peek. $12\frac{1}{2}$-in. spec.

Figure 2. 1926 Sept. 17^d 8^h 15^m
$\lambda_1 = 141°$, $\lambda_2 = 242$
B. M. Peek. $12\frac{1}{2}$-in. spec.

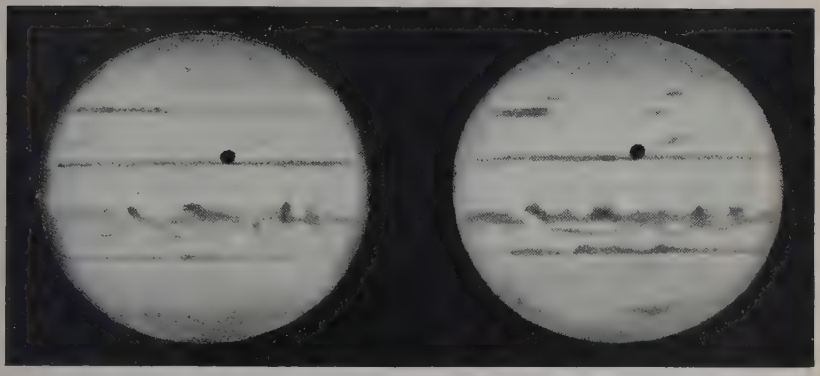


Figure 3. 1926 Sept. 19^d 8^h 40^m
$\lambda_1 = 112°$, $\lambda_2 = 198°$
B. M. Peek. $12\frac{1}{2}$-in. spec.
Shadow of III on disc.

Figure 4. 1926 Sept. 19^d 8^h 40^m
$\lambda_1 = 112°$, $\lambda_2 = 198$
T. E. R. Phillips. 8-in. O.G.
Shadow of III on disc.

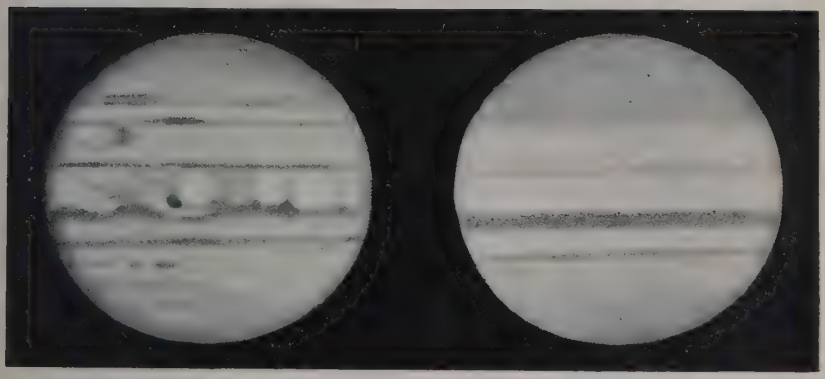


Figure 5. 1926 Sept. 30^d 8^h 50^m
$\lambda_1 = 55°$, $\lambda_2 = 57°$
T. E. R. Phillips. 8-in. O.G.

Figure 6. 1926 Oct. 10^d 9^h 5^m
$\lambda_1 = 203°$, $\lambda_2 = 128$
J. H. Bridger. $8\frac{1}{2}$-in. spec.

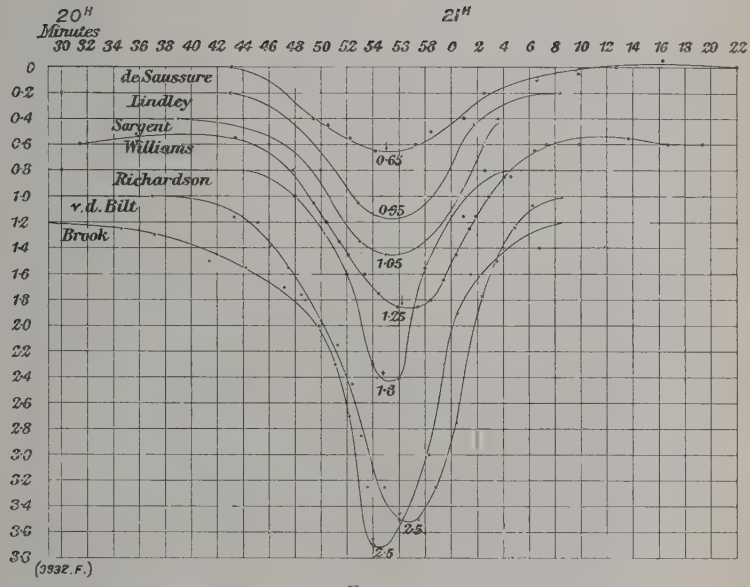


FIG. 1.

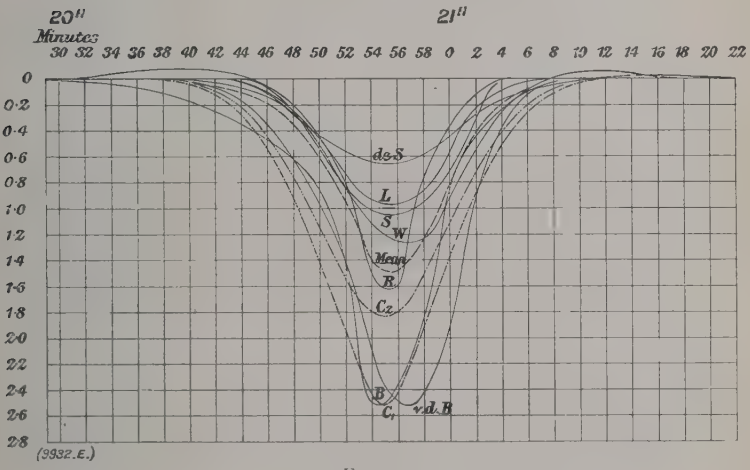


FIG 2.

In Fig. 1 the curves are drawn with a different origin in magnitude for the respective observers.
In Fig. 2 the same curves are drawn with a common origin.

Memoirs
OF THE
British Astronomical Association.

VOL. XXIX.—PART IV.

THIRD REPORT OF THE SECTION

FOR THE OBSERVATION OF

AURORÆ AND ZODIACAL LIGHT.

Director—W. B. Housman.

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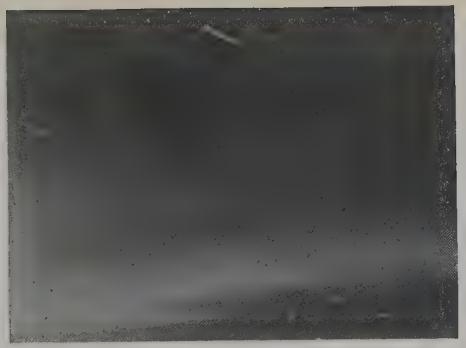


OCT. 15. 01/30 G.T. ARCH IN N.W.

PHOTOGRAPHS

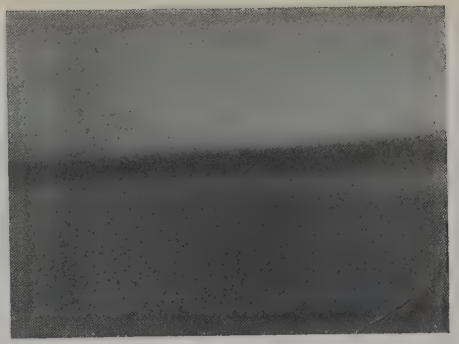
BY

W. B. HOUSMAN

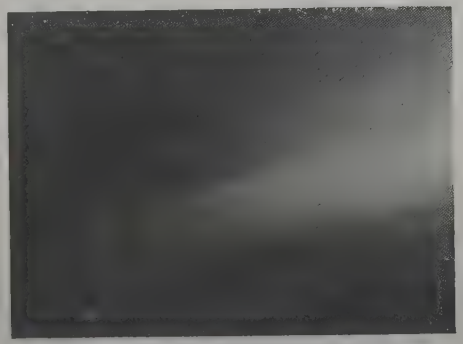
APERTURE F/2

FOCAL LENGTH 4″

EXPOSURE 12 MINS.



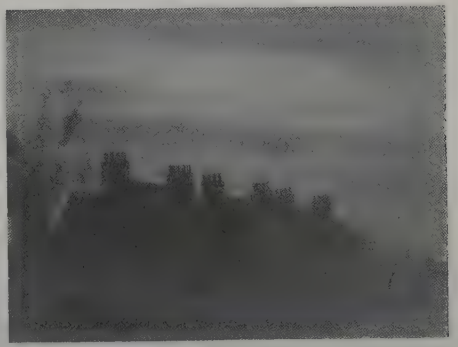
OCT. 15. 01/15 G.T. ARCH IN N



OCT 15. 22/00 G.T. W.N.W. END.

AT SEATON,

CUMBERLAND.



OCT. 15. 22/15 G.T. N.N.E. END.

AURORA OF 1926 OCT. 14, 15, 16 SHOWING DARK LONGITUDINAL BANDS.

SECTION FOR THE OBSERVATION

OF

AURORÆ AND ZODIACAL LIGHT.

DIRECTOR—W. B. HOUSMAN.

THIRD REPORT OF THE SECTION.

This Report deals in detail with the work of members of the Section during the Session 1929/30, but in order to connect the present publication with the previous Memoir, brief notes on the most interesting observations that have been made since 1919 are given below, most of which have been fully dealt with in the *Journal* in the Sectional Reports issued by Mr. Gavin Burns. The entire period covered, therefore, by this Report, is about eleven years, or from the mid-decline of the previous Sun-spot frequency period to mid-decline of the present cycle, and includes both minimum and maximum periods of corresponding auroral frequency.

1920 *Mar.* 22, 23.—One of the most magnificent auroral displays on record. The chief features impressed upon my memory of this display as seen at Seaton, Cumberland, were the wonderful foldings of the broad curtains of light, their very beautiful creamy white colouring, and the pulsations of faint luminosity that seemed to flash upwards from the N.E. and S.W. horizons to meet near the zenith, the central point appearing to be α Can. Venaticor: at 01/00 G.M.T. (new.).

1921 *May* 13, 14, 15.—An aurora of great beauty outshone the summer twilight on these dates, even while the daylight blue still coloured the sky. Both these great auroræ in 1920 and 1921 were definitely associated with enormous sun-spot activity and great magnetic storms.

1922 *Jan.* 31.—Luminous bands about 2° wide and 4° pitch, lying E. and W., covered the sky, and for a short period at

01/30 G.M.T. (new.) a glowing crimson light shone with variable intensity over changing areas of sky. (Fig. F.)

1923 *Mar.* 24.—21/00 to 22/00 G.M.T. (new.). An arch 10° high from which bright streamers shot up parallel to each other with vertical movement only, reaching Polaris at maximum, was seen by the Director over Bassenthwaite Lake. The arch appeared to be centred true north. This display it may be noted occurred in the year of sun-spot minimum, and during a long absence of conspicuous spots.

1924 *Jan.* 29.—The aurora was reported over a wide area from Perthshire to Falmouth.

1925 *Oct.* 14, 00/40 G.T.—A striking luminous segment spread along N.N.E. horizon was seen at Seaton (Fig. D.). It may here be noted that on the evening of this day a most magnificent outburst of active aurora was witnessed in Spitzbergen, graphically described by Commander Worsley, R.N.R., in his book "Under Sail in the Frozen North."

1926 *Mar.* 9.—A short and brilliant outburst of the aurora was seen over England in the early evening; the Corona was observed in Shetland.

1926 *Sept.* 15, 16.—A brilliant aurora was seen in North of England and in Shetland. (Fig. A.)

1926 *Oct.* 14, 15, 16.—A long continued aurora of varying intensity with frequent outbursts of great splendour, and beautiful coloured light. Dark bands crossed the luminous area in the early morning of 15th, and were still a striking feature twenty-one hours later. (Fig. C and Frontispiece.)

1927 *Jan.* 7.—A fine aurora seen at Seaton, and much more brilliant in Shetland.

1927 *Dec.* 28.—A beautiful arch coloured green, orange and crimson was seen by the Director near Seaton in the evening. (Fig. B.) This arch was remarkable by the fact that it was sharply defined on the upper side, diffuse on the underside, and all streamers, which were bright and active, were confined to the luminous area within the arch; all features distinctly the reverse of those usually observed. It was during severe frost.

1928 *Nov.* 13.—A short and brilliant aurora seen in England and Shetland. 18/00 G.T.

1929 *Feb.* 17.—Bright active aurora with concentric arches seen near Workington by the Director during intense frost, followed by a dark sky, spanned by a Galactic arch from horizon N.b.W. to horizon S.b.E., rising to 54° altitude. (Fig. E.) No other reports of this display were ever received.

1929 *Feb.* 27, 28.—A most magnificent aurora seen in North of England and Scotland during the continued frost.

1929 *Mar.* 12.—Fine aurora seen in England and Shetland.

1930.—*See* Sectional Report following.

The foregoing list shows that at least once in each year since 1919, a striking auroral outburst has been reported. Hundreds of reports of lesser manifestations have been received.

DRAWINGS AND PHOTOGRAPHS.

The forms in which the aurora appears have been specially noted in the observations made at Seaton, and during this eleven-year period two distinct types of aurora have been recognised, one bright with more or less visible activity, the other fainter in intensity and almost stationary in character. In the drawings three variations of each class of aurora are shown, the scale being uniform throughout. Except in Fig. F, which shows a zenith region of sky, the lower edge represents an extent of 120° along the horizon, and the upper edge an altitude of 54°, or equal to that of Polaris at Seaton. Magnetic north is shown by an arrow point, true north by a star point. Other bearings are in degrees or compass points.

Fig. A shows the normal type of arch, though its altitude of 20° is above the average for Seaton.

Fig. B is a reversal of A, as noted above, and has only once been observed.

Fig. C shows one feature of many beautiful forms seen during the three-night display of 1926 October. It was a "grand finale" for that night, but recurred in splendour in other forms the following night. The elliptical arc with major axis vertical has only been seen on this occasion, but on 1929 February 27 two small arcs, 35° long, formed near the horizon which were elliptical with major axes horizontal, one in Mn.N and the other immediately to W. of it.

Fig. D shows one (the first) of three similar apparitions of luminous segments. The dates and details of these are shown tabulated below:—

Date and Time	Base	Alt. Centre	True Bearing of Centre
1925-10-14 00/40	100°	10°	39°
1926-10-12 04/00	100°	10° to 15°	22°
1929-10 11 04/00	100°	15°	10°

It is remarkable that the segment has re-appeared within three days of the anniversary of its first appearance on the two subsequent apparitions. The horn-shaped luminous strips on each flank were only seen on the first occasion, and make its total base line 120° if included.

Fig. E shows a "Galactic" arc, which has been noted three times at Seaton, in the three successive displays of 1928 November 13, 1929 February 17, and 1929 February 27. In connection with the first two, the faint arc formed after the active display had entirely gone from the sky. In the February 27 aurora it was seen some 30° alt. in S.W. in dark

sky, whilst the Northern heavens were blazing with streamers, but not further observed on account of the main display occupying all attention. On November 13 it was centred Mn.N., 40° alt., rising to 54°, 120° base. On February 17 it had a base 180°, alt. 54°, and gradually sank by imperceptible movement towards the E.b.N., which was the bearing of its central point.

Fig. F shows the parallel bands seen in 1922 and again noted twice under the heading " Luminous Night Sky " in the Report following for the past Session. Their orientation is variable, having been seen E.-W., N.-S., and E.N.E.-W.S.W. Their luminosity is of Galactic order, but the massed result of the whole sky being crossed by these bands on 1922 January 31, was similar to a very bright aurora, or to quite strong moonlight.

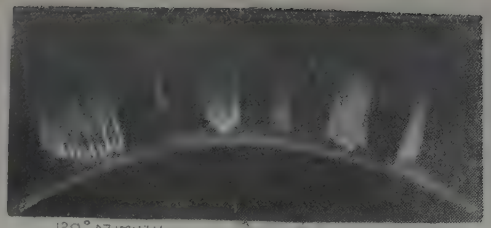
The Director has attempted photography of the aurora and the Zodiacal Light since 1925. The camera used has been an Ernemann (Ernostar) of aperture F/2, focus about 4 inches. Trailing exposures on the Z.L. show the Light plainly registered, but the field is too limited to get both the Light and a sufficient area of dark sky in the view to show the contrast well. No aurora of the order of that of 1920 March 22 has appeared since the camera was used. The auroral arch is easily photographed for 30° of its length, and to 25° altitude, but exposures of the order of 5-10 minutes have been usually required. Streamers near horizon have registered when motionless for a sufficient duration of time, in about 5 minutes. It would seem that the English aurora is seldom of a brilliancy sufficient for exposures of the order of one or two seconds as made in Norway. The colours of the aurora always appear to the Director to be, normally, a golden yellow or primrose tint, and occasionally, crimson, orange and green; three of these being extremely bad photographic lights for ordinary plates, which were used.

ZODIACAL LIGHT.

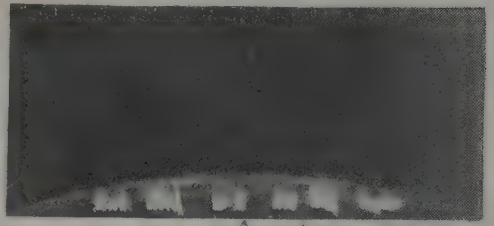
Visual observations have all been tabulated each year in the *Journal*. All records are in north latitudes. The Zodiacal Band and counterglow have been reported as seen in Norfolk, Suffolk, Lincolnshire, Cumberland, India and Egypt. The Director has received reports in the new Session from Tasmania and New Zealand, of aurora and Zodiacal Light, and it is hoped that some interesting comparisons may be made, as these observers send in their reports from time to time. The Report for the past Session is presented below.

Auroræ and Zodiacal Light, 1929-1930.

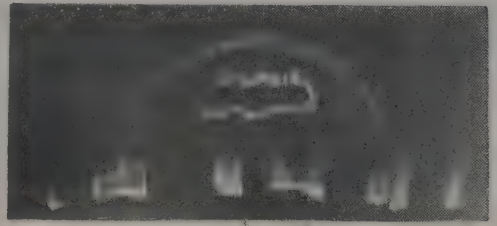
The Report of this Section for the past session contains the contributions of eleven members of the Association, and includes records of Auroræ Borealis, Australis, Luminous Night Skies, Zodiacal Light, Zodiacal Band, and Counterglow.



A. NORMAL ARCH



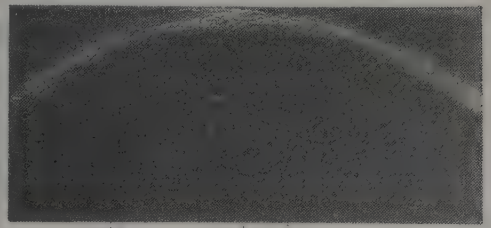
B. REVERSED ARCH



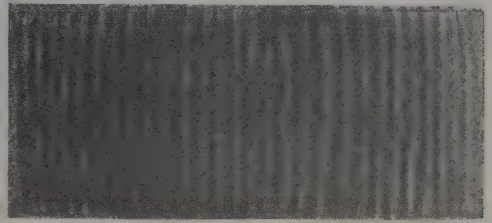
C.

ACTIVE TYPE OF AURO

D. LUMINOUS SEGMENT



E. GALACTIC



F. LUMINOUS BANDS

QUIESCENT TYPE OF AURORA

The Aurora was not so conspicuous in great displays as in the previous season, but a fairly large number of ordinary and faint appearances have been seen, while a special form of this phenomenon, where the sky is illuminated for long periods without the visible movement of light characteristic of ordinary displays, has been observed on several occasions with unusual intensity, and as these appearances seem to be a distinct type, they are recorded separately under the title of Luminous Night Skies. It is probable that they are due to the same physical forces that produce the more active type of Aurora. The normal type is recorded in tabular form in order of date of observation. It will be seen that Mr. Johnson, of Haroldswick, Shetland, whose report was received since the summary report was submitted to the Annual General Meeting, has sent in the bulk of the observations, showing that, as in places further south, the Aurora there has been seen with about the normal frequency, but without great intensity. His observations cover practically the whole season, from twilight to nearly midnight, with reference to cloudiness on every occasion, and are a valuable record of the visibility or otherwise of the Aurora in that region. The solar rotation table in relation to auroral displays observed is given as before. The table includes all displays of every type when the auroral origin of the light has been reasonably certain.

The Zodiacal Light is also recorded in tabular form, the large majority of observations being from Mr. Chandra, just within the Tropics, whose notes include the visibility of the Zodiacal Band at times. Mr. King has supplied some interesting data in observations of the Counterglow. Duplicate observations sufficiently precise to obtain data for position and height of the Aurora have not been secured, but the following instances of simultaneous observations are of interest:—

1927 *Sept.* 7.—Aurora seen at Belford, Northumberland, and not seen at Seaton, Cumberland, though watch was kept at same hour.

1929 *Oct.* 7.—Auroral arch at Seaton, 6° alt., 90° long., from 19/45 to 21/00 G.M.T., was not seen by observer at Haroldswick, Shetland, at that time, though at 21/30 a bright Aurora was reported.

1929 *Oct.* 8.—Aurora observed by the Director at Seaton and Mr. Gordon at Cloch Light, Gourock, in which similar features are noted, with a contrast in colour estimate.

1929 *Nov.* 2.—An interesting double observation was made at 21/00 G.M.T., when Haroldswick reported streamers to zenith, and Seaton streamers near horizon; the difference no doubt due to geographical position of observers.

1930 *Feb.* 17.—Haroldswick station reported a bright Aurora with bands near horizon, while at the same hour the Zodiacal Light was seen undimmed at Seaton in clear dark sky.

1930 *Mar.* 25.—At Ashby, Lincs., the Aurora was looked for up to and beyond midnight, and not seen. At Seaton, Cumb., a faint Aurora and streamers were seen at 23/00 G.M.T.

OBSERVERS AND STATIONS.

Observer	Station	Position	Ref.	Observations
		° ′ ° ′		
J. T. Bird	Belfort	55 35 N., 1 50 W.	B.	A.
B. J. Brown	Diss	52 24 N., 1 7 E.	—	Z.L.
R. G. Chandra	Jessore	23 10 N., 89 15 E.	—	Z.L.
R. L. Clarkson	Oakley	52 20 N., 1 11 E.	O.	A. & Z.L.
W. B. Housman	Seaton	54 40 N., 3 30 W.	S.	A. & Z.L.
A. Johnson	Haroldswick	60 45 N., 0 50 W.	H.	A.
A. King	Ashby	53 34 N., 0 39 W.	A.	A. & Z.L.
W. M. Lindley	Padstow	50 32 N., 5 0 W.	P.	A.
F. C. Molesworth	Various	Given in reports.	—	Z.L.
E. O. Tancock	Holy Isle	55 40 N., 1 48 W.	I.	A.
W. Walters	Tasmania	41 10 S., 147 32 E.	T.	A.

The Director is indebted also to Mr. J. Gordon, of Toward Point, Argyll, for notes on the Aurora of Oct. 8th, with reference letter C, the observation being made from Cloch Lighthouse, Gourock.

SYMBOLS AND ABBREVIATIONS.

In the solar rotation table observations are noted by the reference letter of the station where the Aurora was seen, and dates of the full Moon by a black circle. Time is given in double figures separated by inclined lines, thus: 07/04/19/12 is July 4, $19^h\ 12^m$ G.M.T.

In the tabulated records of Auroræ, the year, month and day are given in the left-hand column, and the various hours and minutes in the Report column. Stations of observation are indicated by reference letters, and cloudiness under heading "Sky" is shown in degrees characterised as follows:—O = overcast; N.O. = nearly overcast; V.C. = very cloudy; C = cloudy; F = fair, or no clouds to hinder observations. Visibility is characterised as V.G. = very good; G = good; M = moderate; B = bad.

Other abbreviations used in the tables are:—

ALT. = altitude from horizon, given in degrees.

AZ. = azimuth given as true bearing in degrees, reckoning from N. round by E.

Z = zenith.

ZL = Zodiacal Light.

ZB = Zodiacal Band.

$>$ = Brighter than — $<$ = Less bright than —

G = Galaxy.

H = Horizon.

EL = Elongation in degrees from the Sun.

In the Zodiacal Light tables Mr. Chandra gives the position of the base usually in degrees of celestial latitude.

SUGGESTIONS FOR OBSERVATIONS.

With a view to obtaining positions and altitudes of Auroral flares, observers should note accurate times, give exact descriptions of the flare or the streamer, and its bearing and altitude to definite points. In the case of bearings the centre of a display might be taken, and of altitudes the underside, which has usually the most definite outline. Special attention might be given to a description of colour as judged by the observer. In this way from a number of cases it could be ascertained what differences were probably due to personal judgment and what colours were probably real. Where the time available allows it is of great advantage to keep a record of cloudiness and visibility on the lines of Mr. Johnson's reports for the usual hours of observation each night. Intensity of Auroral light is also of interest and is seldom noted. The Zodiacal Light is usually compared to the Galaxy. The Aurora is generally so much brighter that such a comparison would be impossible, but the various phases of Moonlight might be usefully employed, or twilight for a given depression of the Sun below the horizon.

Sky luminosity can also be gauged by contrast as well as by comparison. Detached cloud masses are useful for this purpose. In a clear black starry sky clouds are invisible, and their occurrence is only discovered by stars passing out of sight. Against a faint general luminosity the outlines become visible, while in a display of Aurora or bright sky illumination they may become very conspicuous as their black masses pass in front of the lighted areas.

OBSERVATIONS IN SOUTHERN HEMISPHERE.

The observation of Aurora Australis sent in by Rev. W. Walters was made in a low latitude for an Auroral display, though there is a report this session of one in almost as low N. latitude, 42° 40′ in mid-Atlantic. Mr. Walters has also reported the Aurora Australis again this session, in July. Mr. T. L. Thomsen, Director of Auroræ and Zodiacal Light Section in the New Zealand Astronomical Society, writes that in 1929 only four displays of Aurora were noted in New Zealand, and none of these were scientifically observed. He also states that the Zodiacal Light was recorded critically by expert amateurs on ten occasions in their spring, and two facts appear to have been noted which are of interest. The axis of the light appeared slightly southward of the Ecliptic, and the N. edge appeared noticeably sharper than the S. These features are the exact opposite to the usual appearances in similar northern latitudes. The Director would welcome reports from members of the N.S.W. branch, or from any one interested who has opportunity of making observations in the southern skies.

SUMMARY OF OBSERVATIONS OF THE AURORA

Solar Rotation.		Days from Beginning of Rotation.																										
No.	Begins	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
1014	07/04/19/12											A						●										
1015	08/01/00/00														P I						●								
1016	08/28/05/45							H			S	B		S			H S		H				⊙						
1017	09/24/12/00			H			H			H				H S	H S	H	H	S	H		H			●				
1018	10/21/18/57			H	H	H S			H	H S	H	H	H S	H		H	S H	S	O H	O H	H					●		
1019	11/18 02/24			H						H	H			H	H		H	H S	H	H			H					●
1020	12/15 09/50	●							H	H	H	O	H			O H	H	H				H	H S			H		
1021	01/11/17/45			●					H	H	H	H	H		S H	S H		H	H			H						
1022	02/08/02/10					●				H	H	H	H			H										H		
1023	03/07/10/04						H	●			H	H				H	H		S				H					
1024	04/03/17/16			H				H		●		H	H	H	H	H	H											
1025	04/30/23/31												●															
1026	05/28/05/02														●					T								
Total - 1st Quarter - - 10									2nd Quarter - - 39							3rd Quarter - - 32						4th Quarter - - 5						

Letters refer to Observing Stations. Black circles are at Full Moon dates.

Date. 1920.	Station.	Sky.	Visibility.	Aurorae. Reports.
07/15	A	Twilight.		First seen as pale reddish pillar vertical to and 2° left of β Ursae Maj: 3° to 4° wide. Stationary, or slight movement to left, at 23/29. At 23/34 pillar gone and replaced by faint one, a few degrees to left. At 23/41 this faded and a more marked one pointing to ζ—ϵ Ursae Maj: appeared, equal in width to first, but at lower altitude. At 23/48 third pillar gone, but one suspected 5° to R. The position of these pillars was such that they could not have been solar atmospheric effects.
08/14	I			At 21/45, Rays nearly vertical seen just E. of N.; faded slightly, and increased W. of N. One streamer reached nearly to Z., and moved W.–N.–E. At 21/55 display subsided to a glow on the horizon.
08/14	P	VC	B	Two vertical streamers up to 20° Alt. slightly W. of N. at 21/32. At 21/36 one due N., 21/38 several N. to N.W. 21/40 clouds interfering. 21/41 pencil to ψ Ursae Maj. 21/45 clouds again. 21/49 pencil up to κ Ursae Maj.
09/03	H	F	VG	20/30 to 23/00 faint glow along the horizon W.–N.–N.N.E.
09/07	S	F	VG	A very faint display before dawn. A shaft or narrow cone equal to Z.L. (then also visible) was seen stationary below Draco, 15° high. A very faint array of parallel streamers followed on either side. Intensity = 2 G. The Aurora, Z.L., and Galaxy all seen together, making luminosity estimate very easy. 03/00.
09/07	B	F	VG	Short and very faint streamers, slightly to E. of N. at 21/45. By 22/00 extended to 35° W. of N. No arch seen. Glow seemed to be fading at midnight.
09/07	S	F	G	Sky observed from 21/00 to 23/00 and no trace of Aurora observed.
09/08	S	F	G	No Aurora seen 03/00 to 04/00.
09/09	S	F	G	The Aurora emerged from twilight at 21/00. Centre of glow 345° AZ. At 21/55 concentrated bright streamers at 5° Alt., one at 345 AZ. No arch rose.
09/09	S	F	G	Altitude not exceeding 20°. Occasional activity in very low altitude of streamers and luminous clouds. Observation of horizon ceased at 23/15 when base of glow was 25° long, to 10° Alt. Glow continued until clouds obscured sky at 02/00.
09/12	H	F	VG	20/00 to 20/30 no Aurora. 20/45 to 23/00 glow visible W.N.W. to N.N.E. Upper limit midway between H., and α Ursae Maj.
09/12	S	F	VG	Northern horizon luminous from 280° to 40°. At 345° AZ. glow rose to 20° Alt. Intensity at 345° = 3 G. The Galaxy was setting at W. end and rising at E. end of the Auroral glow, which was a faint display.
09/14	H	F	VG	20/00 to 21/30 no Aurora visible. 22/00 to 23/15 glow on N. horizon, W.N.W.–N.N.E.
09/27	H	C	VG	20/00 to 23/00 glow visible through breaks in clouds.
09/30	H	C	VG	20/00 to 21/00 no Aurora visible. 21/30 to 23/15 glow visible through cloud breaks W.–N.N.E.
Sept. Other Dates	H	O NO VC C F		7, 11, 13, 16, 17, 23, 26 1, 2, 5, 6, 8, 9, 10, 18 4, 25 19, 20, 21, 22, 24 15, 28, 29 } No Aurora visible.
10/03	H	C	M	20/00 to 21/00 no Aurora visible. 21/30 to 23/00 W.N.W.–N.–N.E. glow, seen through breaks in clouds.

Date. 1929.	Station.	Sky.	Visibility.	Aurorae. Reports.
10/07	S	F	VG	19/45 Glow seen from Observatory. 20/00 Horizon observed, and Aurora seen as arch, 6° Alt., 2° wide, 20° long, with luminosity above and below, the latter feature being unusual. AZ. of centre 345°. Luminosity up to 20° Alt. there. 21/00 clouds and heavy rain for rest of night.
		O		
10/07	H	C	VG	10/00 to 21/00 no Aurora visible. 21/30 to 22/00 bright glow W. to N.E. 22/30 to 23/00 Do. W. to E.N.E., with bright streamers and luminous waves ascending to Capella near Zenith.
		C		
10/08	H	F	VG	19/30. Glow above cloudbank W.-N.-N.E. 19/40 seen mostly obscured by clouds. 19/50 seen through breaks in clouds. 20/15 to 22/30 not visible.
		NO		
10/08	S	F	VG	20/00. Auroral glow seen commencing in a clear sky. 20/20 Streamers very bright up to 30° Alt. covering 70° of horizon base centred 345° AZ. 20/30 Curtain formed low in N., moved to NW. across 45° of sky in 5 minutes of time, slightly expanding in breadth as it travelled. No arch seen. Light golden yellow. Horizon observed 20/15 to 20/45, when activity subsided to glow. 23/00 glow increased, streamers formed. Aurora then faded out.
10/08	C			20/30. Streamers numerous between Kirn and Kilcreggan. 20/36 Solitary streamer leisurely appeared from behind Loch Long, taking 5 minutes to rise. Colour bluish white to creamy white. Travelled W. to Strome Point, where at 20/47 it was joined by many minor streamers and continued to travel towards Kilmun. 20/53 Black out.
10/09	H	C	VG	Glow seen through breaks in clouds. W.-N.-E., at 20/00
10/10		F	VG	to 23/00. At 10/10/01/00 bright glow W.-N.N.E.
10/12	H	F	VG	Bright glow W. to N.E. at 20/00. At 21/00 a band stretched from W., through N. to N.E. Streamers in N. 22/00 to 23/00 two bands, one stretched along horizon from N.W. to N., another W.-N.-NNE. Luminous discharges ascended up from both bands.
10/14	H	C	VG	20/00 to 21/00 no Aurora visible. 21/30 glow W.-N.-N.E.
10/24	H	C	VG	Bright glow W.S.W.-N.-N.E. 19/00 to 23/00.
10/25	H	F	VG	20/00 to 24/00. Bright glow W.-N.-N.N.E.
10/26	H	C	VG	Glow along N. horizon. 20/00 to 23/00.
10/26	S	F	VG	21/00 to 22/00. Very slight glow N.W. Dark after 22/00.
10/29	H	F	VG	Horizon glow W.-N.-N.E. 20/00 to 23/15.
10/30	H	F	VG	Bright glow W.-N.-N.E. at 19/00. 19/25 visible
		VC		through cloud breaks. 20/00 to 22/00. V. cloudy, not visible.
10/30	S	F	VG	19/40. Glow seen on horizon. Very faint streamers. Short bright beams shone and waned at intervals till midnight, tending to decrease. Extent of glow 60°–70° base, 345° AZ. centre, 15° Alt. At 00/00 (Oct. 31) Aurora ceased and a luminous sky = ZL. overspread the heavens.
10/31	H	F	VG	20/00. Bright glow W.-N.-N.E. along H. Luminous haze over whole N. quadrant of sky up to Zenith.
Oct.	H	O		4, 11, 13, 15, 16, 28 } No
Other		VC		1, 2, 5, 6, 10, 17, 18, 19, 20, 21, 21, 23 } Aurora
Dates.		F		27 } visible.
11/01	H	F	VG	21/00 to 21/10. Glow on H., W.-N.-N.E. 21/15 to 23/30. Bright display of Aurora. Two bands stretched from W.-N.-N.E. Upper band passed over η Draconis.

Date. 1929.	Station.	Sky.	Visibility.	Aurorae. Reports.
11/02	H	F	VG	00/40. Five bands crossed the sky W.S.W.–N.–N.E. Upper band passed over Polaris. Streamers shooting towards Z from all bands.
11/02	H	C	VG	19/00. Glow covered most of N. quadrant. At 19/20 arch seen W.–N.–N.E. with bright streamers passing near β Ursae Maj. 19/30 Bright streamers N.W. to N. moving broadside Westwards. 19/35 Three bands terminating in cloudbank above N.E. and W. horizons. Aurora very active in N.W. 21/00 to 23°30 Streamers up to Z. continuing active. Watch ended 23/30.
11,02	S	F	VG	20/30. Auroral glow seen. Detached luminous glow in N.W. extended towards E. and became an arc, 12° high, 60° long, ends not reaching horizon. It was a very flat arch suspended in N.N.W. sky. No streamers. Duration 1-2 minutes. 21/00 Streamers at N.W., N., N.b.E., and at 345° AZ., near horizon. 21/15 abating. 22/00. Faint glow.
11/03	S	F	VG	00/50. Bright glow. 02/40 glow faint. 04/30 the same. 05/00 Glow merged in dawn.
11/03	H	C F	VG	19/00. Glow along N. horizon. 19/30 Streamers shooting up from N.W. to near Z. 20/00 to 22/00 N. quadrant of sky very luminous.
11/05	H	NO VC	M M	20/00 to 21/00. No Aurora visible. 21/30 to 23/00 glow visible through breaks in clouds over N.W. and N.E. horizon.
11/06	H			No observations, but Aurora reported by others.
11/08	H	—	—	22/30 to 23/45 N. quadrant of sky luminous.
11/09	H	C	VG	21/00 to 23/00. Glow over N. quadrant of sky.
11/10	H	F	VG	Glow covered greater part of sky throughout the night.
11/20	H	F	VG	Glow above H. in W. Streamers in N.W. and N., moon above N.E. horizon 18/10 to 18/30. 18/45 to 22/00 moonlight. No Aurora visible.
11/26	H	F	VG	18/30 to 23/15. Glow W.–N.–N.E. Brightest in N.N.W.
11/27	H	F C	VG	18/00. Glow N.W. to N.N.E. Streamers low in N. 19/00 to 20/00. Glow seen through cloud breaks.
11/30	H	F	VG	19/00 to 24/00. Glow W.–N.–N.E.
Nov.	H	O		4, 7, 11, 21, 22, 23, 24, 28 } No aurora visible.
Other Dates		VC F		8, 12, 13, 15, 16, 17, 19, 25, 29 14, 18 } No aurora visible.
12/01	H	C	VG	19/00 to 23/00. Glow seen between clouds W.N.W.–E.N.E.
12/03	H	F	VG	17/10 to 17/30. Glow and faint streamers on N. horizon. 18/00 to 23/10. Glow seen through cloud breaks.
12/04	S			18/53. Glow visible centred 345° A.Z. Base 50° along H., 15° Alt. Streamers seen. No devolopments.
12/04	H	NO	M	19/00 to 20/30. No Aurora visible. 21/00 Glow seen through breaks in clouds. At 22/00 arch seen, from W.N.W.–N.–N.E. Top of arch passing over Vega and η Ursae Maj. Streamers shot from H to arch, moving broadside Westwards. 22/25 Arch ended in W., and whole moved S. several degrees. Bright streamers in N.W.
		C	G	
		F	VG	
12/05	H	NO	M	19/00 to 21/00. No Aurora visible. 21/30 to 23/00. Bright glow visible through breaks in clouds.
12/06	H	F	VG	Two bands seen, 18/10 to 19/30. One W. to E. over the Plough, the other low down near horizon. Few streamers in N. 20/00 Upper band still visible. 20/30 to 22/30, bands diffused into glow over N. quadrant of sky.

Date. 1929.	Station.	Sky.	Visibility.	Aurorae. Reports.
12/09	H	VC C	G G	19/00 to 21/30. No Aurora visible. 22/00 to 23/00 Glow visible through breaks in clouds.
12/22	H	VC	G	19/00 to 22/45. Glow visible in N. quadrant between clouds.
12/23		C	G	19/00 to 23/00. Ditto.
12/24	H	C	G	19/00 to 23/15. Ditto.
12/26	H	F	VG	19/00 to 23/10. Glow near H. N.W.–N.–N.N.E.
12/29	H	C	VG	19/00 to 22/45. Faint glow seen through breaks in clouds.
12/30	H	C	VG	19/00 to 23/00. Glow visible through cloud breaks.
12/31	H	C	VG	19/00 to 21/00. Not visible. 21/30 to 24/00. Bright between clouds.
Dec.	H	O		2, 20, 21, 25 } No Aurora visible.
Other		VC		7, 8, 10, 11, 12, 13, 14, 15, 17, 18, 19 } No Aurora visible.
Dates.		F		16, 17, 28 } No Aurora visible.
1930				
01/04	H	F C	VG	Two bands visible. 18/30. Upper band W.N.W. to N.E., over η Ursae Maj. 19/00. Cloudy in N., very long bright ray in N.E. 19/15, Streamers to Cassiopeia. 19/20, Glow over N. quadrant of sky. 19/30. Long bright ray in N.W. 19/40, Same in W. 20/40, Two bands again visible, one low down along horizon, the other higher, W.N.W. to N.E.
01/05	H	F C	VG	18/00 Band along H., W.N.W.–N.–N.E. 18/30 Streamers to near Z. 19/00 The same. 20/00 to 22/00 Aurora fainter. Visible between clouds.
01/06	S			03/00. Auroral glow seen. No streamers.
01/08	H	F	VG	19/00 to 19/30. No Aurora seen in moonlight. 20/15 to 20/30 Long streamers from N.E., H. to Z.
01/19	H	C	VG	19/00 to 22/00. Glow along H., N.W.–N.–N.E.
01/20	H	C	VG	18/00 to 23/00. Bright glow along H., W.–N.–N.E.
01/21	H	C	VG	19/00 to 22/30. Glow along N. horizon.
01/22	H	F	VG	18/30 to 22/40. Glow N.W. to N.E.
01/23	H	F	VG	18/30 to 23/15. Bright glow W.N.W.–N.–N.E.
01/25	H	F	VG	19/00 to 23/10. Faint glow in W. to N.E.
01/26	H	F	VG	19/00 to 23/00. Faint glow along N. horizon.
01/28	H	F	VG	18/30 to 21/30. Faint glow on H, W.S.W.–N.E.
01/29	H	C	VG	19/10 to 23/30. Do. visible between clouds.
Jany.	H	G		2, 3, 6, 7, 16, 17, 24, 27, 30, } No Aurora visible.
Other		VC		1, 9, 12, } No Aurora visible.
Dates		C		10, 11, 15, 18, 31, } No Aurora visible.
		F		13, 14, } No Aurora visible.
02/01	H	C	VG	Glow seen W.–N.–N.E., 19/00 to 23/10.
02/16	H	F	VG	18/30 to 20/00. Bright glow and a few streamers low N.
		C	VG	20/30 to 23/00. Glow seen between clouds.
02/17	H	F	VG	18/45 Band on H., N.W.–N.–N.N.E. 19/00 to 20/00 Band moved forward very slowly. 19/50 Band extended W.–N.N.E. passing over Vega. Streamers were very active, shooting upwards all along band, and moving broadside Westwards. 19/40 Band broke and assumed form of folded drapery, then re-formed band. 20/00 Lower edge just above Vega. 20/10 Band spread out into broad diffuse light, streamers not very active. 20/20 to 23/15 Faint glow continued.

Date. 1930.	Station.	Sky.	Visibility.	Aurorae. Reports.
20/18	H	F	VG	19/00 to 21/00 No Aurora visible. 21/30 to 23/00 Glow seen W.-N.-N.E.
02/19	H	C	VG	Glow W.N.W.-N.-N.E. 19/00 to 22/30 seen at times.
02/22	H	F	VG	19/00 to 21/00 Not visible. 21/30 to 23/00 Glow from W.N.W.-N.-N.N.E. rather faint.
Feby. Other Dates.	H	O VC C F		20, 23, 24, 25, 10, 11, 13, 15, 27, 28, 2, 3, 4, 12, 14, 21, 5, 6, 7, 8, 9, 26, } No Aurora visible.
03/05	H	F C	VG VG	19/00 to 20/40. No Aurora visible. 22/30 to 24/00 Glow visible between clouds.
03/13	H	C	VG	19/00 to 22/15. No Aurora visible. 20/45 to 21/30 Bright Aurora, W.N.W.-N.-N.E. Coloured streamers, very active. 21/45 to 22/30. No Aurora visible.
03/17	H	C	G	19/00 to 23/00. Glow W.-N.-N.E., a few streamers visible.
03/18	H	C	G	20/30 to 23/15. Bright glow W. to N.E.
03/22	H	F	VG	19/00 to 21/00. Not visible. 21/30 to 23/00 Glow visible W.-N.-N.E.
03/23	H	C	G	19/00 to 22/30. Glow seen between clouds.
03/25	S			23/00. Very faint display on horizon. Centre 345° AZ. Streamers from horizon to 20° Alt.
03/24 25 and 26	A	F	VG	Aurora looked for but not seen each night up to 1½ h. past midnight.
03/29	H		VG	19/00 to 21/00. None visible. 21/15 to 23/30. Glow W.-N.-N.E.
March Other Dates.	H	O VC C F		1, 2, 6, 7, 8, 12, 25, 26, 27, 28 3, 4, 11, 14, 19, 30, 31 10, 15, 16, 20, 21, 24 9 } No Aurora visible.
04/06	H	C	VG	20/00 to 21/00. Not visible. 21/15 to 23/00 Bright glow W.-N.-N.N.E., with streamers shooting towards Z.
04/10	H	C	VG	20/00 to 23/00. No Aurora. 23/10 to 23/30 Streamers above N. horizon.
04/14	H	C	VG	20/00 to 21 00. Not visible. 21/15 to 23/00 Glow seen between clouds.
04/15	H	VC C	G	20/00 to 21/30. Not visible. 22/00 to 23/15 Bright glow visible through breaks in clouds on N. horizon.
04/16	H	VC	G	20/00 to 21/30. Not visible. 22/00 to 23/20 Bright glow seen between clouds, W.N.W.-N.-N.E.
04/17	H	C	VG	20/00 to 21/00. Not visible. 21/30 to 23/00 Glow W.-N.-N.E.
04/18	H	C	VG	20/00 to 21/30. Not visible. 22/00 to 23/00 Glow W.-N.-N.E.
04/19	H	C	VG	20/00 to 21/15. Not visible. 22/30 to 23/15 Glow W.N.W.-E.N.E.
April Other Dates.	H	O VC C F		1, 2, 3, 4, 5, 7, 8, 9, 26 11, 20, 27, 28, 30 21, 25, 29 12, 13 (No observations on 22, 23, 24) } No Aurora visible.
06/16	T			09/00 to 09/30 (G.M.T.) Aurora Australis observed after twilight ended, as bright glow with occasional streamers of very pale green from S.E.-S. almost to S.b.E., where heavy clouds covered the summit of Mt. Scott. There was a second glow without streamers at S.W.

Observer: R. G. Chandra						Zodiacal Light
No.	Date 1929.	Time I.S.T.	Sun Rise	Sun Set	Apex. Position	Report
1	08/29	19/23		17/52	Galaxy	Z.L. seen in very peculiar form. Direction of axis from about +30° at H. to −20° in Libra. Position slanting along horizon. Base not completely visible. Intensity=G. in Scorpio.
2	08/30	19 23		17/52		
3	10/22	18/08		17/02	Up to G in	Seen in peculiar form like a triangle.
4	10/23	18/08		17/01	Sagittar.	Apex at G. in Sagittarius. N. line along line of stars η, ζ, ϵ, δ, Ophiuchi and ϵ and δ Serpentis and a few degrees N. close to W. horizon in Boötes. The S. line along H. till merged with G. in Scorpio. Other line (from apex to end of S. line) merged in G. Glow very bright after twilight ended.
5	10/24	18/33		17/00	,,	
6	10/25	18/33		16/59	,,	
7	10/29	18/13		16/57	,,	
8	10/30	18/13		16/56	,,	
9	10/31	18/13		16/55	,,	
10	11/02	18/33		16/05	Up to mid. of Capricorn.	Apex fairly traceable beyond G., up to mid Capricornus. Visible base up to S. of θ and i Scorpionis in S., and up to N. of ζ Ophiuchi in N. The glow merged in G. was very bright.
11	11/03	03/33	05/40		Z.	Apex traceable to Z. Base from +20° in Coma Ber. to −20° in Crater. A good display below Regulus.
12	11/05	03/33	05/41		G.	Base from +20° just S. of cluster of Coma Ber. to −15° near δ Crateris.
13	11/06	03/33	05/41		in Gemini	
14	11/07	03/33	05/42		,,	Good display below Regulus.
15	11/09	04/13	05/43		Z.	Base from +20° N. of Coma Ber. to γ Corvi. Very bright below σ Leonis, and up to γ Virginis. > G. in Gemini. Display around γ Virginis brighter at 04/23. Dawn at 04/33.
16	11/10	04/13	05/44			
17	11/11	03/33	05/44			
18	11/12	03/03	05/45			Seen first around β Virginis at 03/03. It developed gradually, and base at 03/48 extended from β Corvi to a Coma Ber. At 04/03 a bright glow developed between β and γ Virginis. At 04/33 it was brightly displayed round γ Virginis and was seen right up to E. horizon just above the bush. Base from +20° beyond η Boötis to −30° S.E. of β Corvi. Axis along Ecliptic, very bright.
19	11/13	03/03	05/46			

Observer: R. G. Chandra						Zodiacal Light
No.	Date 1929	Time I.S.T.	Sun		Apex Position	Report
			Rise	Set		
20	11/19	18/13		16/47	Z.	Z.L. seen every day in the evening sky as usual.
21	11/20	18/13		16/47		
22	11/21	18/30		16/46		
23	11/22	18/13		16/46		
24	11/23	18/13		16/46		
25	11/24	18/13		16/46		
26	11/29	18/03		16/46		
27	11/30	18/03		16/46		
28	12/01	04/33	05/58			Apex up to Z near Regulus. Base +15° N. of δ Serpentis to −30° N. of θ Centauri. Good display round and below Spica. Axis along Ecliptic. Intensity very bright.
29	12/01	18/03		16/46	λ Aqua.	Base from +20° in Ophiuchus to −40° in Sagittarius. A good display.
30	12/02	04/33	05/57			Seen as on December 1st (morning).
31	12/02	20/03		16/46	Z. band seen.	Moon set 17/34. Z.L. was distinctly seen above young moon, and after moonset the glow was very prominent and visible till 20/03 in Capricornus. Very bright in mid Capricornus, just above and around θ Cap. Apex not well defined. Z. Band seen across the sky to the E. up to G. in Taurus, near Aldebaran and 2♃.
32	12/04	04/33	06/00		Z.	A very good display below Spica, base from +15° S.E. of γ Serpentis to −35° N. of θ Centauri. Apex to Zenith. Very bright between Spica and α Librae
33	12/05	04/33	06/00		Z.	Axis along Ecliptic. As above.
34	12/11	04/03	06/04		Beyond	Base at 04/23 from +10° S. of γ Serpentis to −45° S. of ω Centauri. Axis about 3° N. of Ecliptic. Very bright around α Librae.
35	12/12	04/03	06/05		Z.	
36	12/13	03/03	06/05		Z.	Glow seen below Spica with apex fairly traceable to Regulus. Seen gradually rising up and brightening till 04/33. After 04/38 it faded away as dawn advanced.
37	12/14	03/33	06/06			

Observer: R. G. Chandra — Zodiacal Light

Mo.	Date 1929	Time I.S.T.	Sun Rise	Sun Set	Apex Position	Report
38	12/15	04/48	06/07		Z.	Visible at moonset, 04/33. Good display above α Librae 04/43. Very bright around and below this star at 4/53. Dawn then commenced.
39	12/18	18/03		16/50	Z.	Prominent in Cap. and Sagit.
					Z. Band seen.	Very bright below α and β Cap. Base visible from equator N. of Scutum to $-35°$ W. of Micro. Apex not well defined. Z. band seen across Zenith Axis 4° N. of Ecliptic. > G in Sag.
40	12/19	18/33		16/51		
41	12/20	18/33		16/51		Seen each day displayed as on 12/18.
42	12/22	18/33		16/52		
43	12/23	18/33		16/52		
44	12/26	18/18		16/54	Up to ϕ Aquarii	Base from equator below θ Aquilae to $-32°$ near α
45	12/27	18/03		16/55		Micro. Apex fairly traceable to ϕ Aquarii, where it
46	12/28	18/03		16/55		merged into faint streak of Z.B. to Hyades. Very bright in Cap. Axis along Ecliptic.
47	12/29	04/33	06/14		Z.	Base from Equator S of κ Oph. to $-35°$ near ξ Micro. Very bright between δ and β Scorpii and α Librae. Axis 3° N. of Ecliptic.
48	12/29	18/33		16/56	Z. band seen.	Very bright in Cap. Glow in Aquarii visible till 19/48. Apex not well defined. Z. Band seen to Hyades. Axis along Ecliptic. > G. in Cygnus.
49	12/30	04/33	06/14		Z.	As on 12/29 a.m.
50	12/30	18/13		16/56	Z.B.	As on 12/29 p.m.
51	12/31	04/43	06/14		Z.	Base +28 in Ophiuchus to $-48°$ near γ Lupus. Very bright from χ Oph. to μ Librae. Axis 3° N. of Ecliptic.
52	12/31	18/33		16/57	Z.B.	As on 12/30 p.m.
53	1930 01/01	19/33		16/58		Glow seen in Aquar. till 19/33.

Observer: R. G. Chandra					Zodiacal Light	
No.	Date 1930	Time I.S.T.	Sun		Apex Position	Report
			Rise	Set		
54	01/03	04/43	06/15		Z.	Seen very bright in Scorpio and Librae.
55	01/05	04/48	06/16		Z.	Do.
56	01/07	04/33	06/16		Z.	Do.
57	01/10	04/33	06/17		Z.	Do.
58	01/11	04/33	06/17		Z.	Do.
59	01/12	04/15	06/17		Z.	Do.
60	01/17	18/23		17/09	Aries.	Base +5° S.W. of ϵ Pegasi to −25° N.W. of Formalhaut. Very bright conical display with axis along Ecliptic.
61	01/18	18/23		17/10	Aries.	Do.
62	01/19	18/23		17/10	Aries.	Do.
63	01/20	18/23		17/11	Aries.	Do.
64	01/21	18/23		17/12	Aries.	Do.
65	01/22	18/23		17/12	Aries.	Do.
66	01/23	19/06		17/13	Aries.	Do.
67	01/24	18/36		17/14	Z.	Apex to middle of Aries.
68	01/25	18/36		17/14	Z.	Base +10° N.W. of θ Pegasi to −25° N. of Formalhaut. A very good display in Aquarius and Pisces. Intensity brighter than G in Cassiopeio.
69	01/26	18/36		17/15	Z.	
70	01/27	18/51		17/16	Z.	
71	01/28	18/21		17/17	Z.	
72	01/29	18/36		17/17	Z.	
73	01/30	18/36		17/18	Z.	Axis along Ecliptic.
74	02/06	04/36	06/16		—	Merged in Galaxy. Faint streak of Z.L. seen in Ophiuchus before Galaxy became visible.
75	02/07	04/36	06/16		—	
76	02/08	03/36	06/16		—	
77	02/15	18/36		17/28		Base +15° E. of α Pegasi to −15° at border of Cetus. Glow passed between the configuration of ι, γ, δ Ceti and α, β, γ Arietis, along the Ecliptic, and was visible till 20/36. > G. in Taurus.
78	02/16	18/36		17/28		
79	02/17	18/36		17/29		
80	02/18	18/36		17/29		
81	02/19	18/36		17/30		

Observer: R. G. Chandra					Zodiacal Light	
No.	Date 1930	Time I.S.T.	Sun Rise	Sun Set	Apex Position	Report
82	02/20	20/06		17/30		
83	02/21	19/36		17/31		
84	02/22	19/06		17/32		Base +15° below γ Pegasi to −15° near β Ceti.
85	02/23	19/06		17/32		
86	02/24	19/06		17/32		
87	02/25	03/51	06/00		—	Z.L. merged in G. in morning, but seen in evening sky as usual. Base +25° below α Androm. to −15° S. of η Ceti. Glow visible through clouds.
88	02/25	18/36		17/33	Pleiades.	
89	02/26	18/36		17/33	Galaxy.	
90	02/27	18/36		17/34	Galaxy.	
91	02/28	18/36		17/34	Galaxy.	
92	03/02	18/51		17/35	Pleiades.	In spite of young moon, Z.L. was distinctly seen in evening sky. Base +25° S.W. of α Androm. to −15° S. η Ceti. After moonset it was well displayed in Aries.
93	03/04	04/16	05/54		—	Z.L. not prominent in morning sky.
94	03/24	19/06		17/44	Galaxy.	Base +25° N. of γ Arietis to Equator near δ Ceti. Axis 4° N. of Ecliptic. Glow in Aries = G. Taurus.
95	03/25	19/06		17/44		
96	03/26	19/06		17/44		
97	03/27	19/06		17/45		Cloudy, but details seen as above.
98	04/14	19/06		17/51		Base +35° below ρ Persei to Equator at RA. 3h. 20m. Axis 3° N. of Ecliptic.
99	04/15	19/06		17/52		
100	04/16	19/06		17/52		Jupiter within the glow. Seen in triangular form. > G. in Taurus.
101	04/22	19/16		17/54	Gemini near Pollux	Base + 45° in Persius to −5° in Eridanus. Axis 3° N. of Ecliptic. > G. in Gemini. A good triangular display in spite of clouds.
102	04/23	19/16		17/54		
103	04/28	19/36		17/57	Pollux	Base + 45° N. of ϵ Persei to Equator in Orion. Good display in Taurus.
104	06/28	20/10		18/20	γ Virginis	Z.L. seen only in a slanting form. Visible until 21/10. Axis 2° N. of Ecliptic. Base not distinguishable in twilight.

Observer: A. King						Zodiacal Light
No.	Date 1929	Time G.M.T.	Sun Rise	Sun Set	Apex Position	Report
1	05/07	23/15		19/42	81° El.	Suspected in Gemini and to a degree or so past Praesepe.
2	05/08	22/55		19/44	83° El. Inclination Zero	Certainly seen though faint. N. border at Mars (a, 8 h. 0 m. δ + 22°-23′.) 3° to 4° wide there. Traced to 3° past δ Cancri. Brighter parts too low, or set.
	1930					
3	02/15	20/00		17/11	90° El.	Air hazy low down, but cone to 26°+12½°. Only upper part visible. Extension 4°-5° wide traced through Aries. Reached to 54°+20½°. Visible till 20/35, when moon rose. Inclination 1° N. Slightly > G in Cassiopeia.
4	02/19	19/35		17/20	89° El.	Fairly easy S. of a and β Arietis, and traced to about 4½° S. of Pleiades = 2 G. in Ceph. (In Pisces). Incl. 0°.
5	03/24	20/15		18/21	60° El.	Air clear, Z.L. a bright cone, reaching to about 37 Tauri. ±5 G. in Gemini (in Aries.) No extension.
6	03/30	20/55 and 21/08		18/33	±56° El.	Very bright, end about 63°÷21°, but clouds interfering. At 21/08 sky clear, Z.L. certain to $\upsilon\kappa$ Tauri, extension to 84°+24° fairly sure. 2↓ interfering = 3 G. in Cass. on confines of Aries.
7	04/15	22/00		19/2	101° El.	Reached G. near ζ Tauri, continued to Praesepe beyond. Once suspected beyond the cluster. Incl. 1½°-2° N. Air very clear.
8	04/18	22/00		19/8	85° El.	Seen crossing G. to about κ Gem. Much cloud.
9	04/30	22/55		19/30	106° El.	Easily seen in Gemini. Passed γ and δ Cancri, just enclosing the pair. At 69° El. = G. in Cass. Traced to 2° or 3° from Regulus with difficulty.
10	05/01	00/00		19/31	95° El.	N. edge passes through γ Cancri, and about 4° wide there. Also through κ Gem., there 5° wide. Traced for 3° beyond γ and δ Cancri, and uncertain after, but 95° El. appeared the limit.

Observer: A. King						Zodiacal Light
No.	Date 1929	Time G.M.T.	Sun Rise	Sun Set	Apex Position	Report
	1929					THE COUNTERGLOW.
1	05/08	23/00				Seen as very faint oval patch 10°-15° long, 4° to 5° wide on Ecliptic 178° from Sun. Centre below α Librae, 226° Longitude.
2	10/30	23/45				Seen fairly easily as oval some 7° wide, 15° to 20° long, centre 176° from Sun, on Ecliptic in S. region of Aries. 41° Long:
3	10/31	23/45				Seen as on previous night.
	1930					
4	03/30	00/15				Seen as oval-shaped area like a faint galaxy between γ and η Virginis and ϵ Virginis and γ Corvi. About 7° wide and 25° long.
5	04/30	23/40				Seen as oval patch like galaxy on the Ecliptic from ι κ, λ Virg. to κ Librae. Ill-defined but certain. A brighter oval patch was centred 5° to 6° from α Librae at 219° Long:
6	05/02	00/15				Very difficult to see, but centred round a point about half-way from α Librae and κ Virg., 178° from Sun, 1½° N. of Ecliptic, about 219° Long:

Observer: W. B. Housman						Zodiacal Light
No.	Date 1929	Time G.M.T.	Sun Rise	Sun Set	Apex Position	Report
1	09/03	03/00	05/24		G.	Observed from 02/50 to dawn 03/15. Base 40°, commencing in Leo Minor. Upper boundary sloped upwards below Pollux to merge in G. Luminosity at 3° alt. > G. in Gemini. At same alt. G. itself was quite invisible. Above 5° alt. Z.L. = G. adjacent. Boundaries were quite vague.
2	09/07	03/00 to 03/30	05/31		G.	Dawn at 03/30. Base 30° = G. in Auriga. The Aurora faintly mingled with the Z.L. at N. end of base. S. end of base vertical below Pollux, which star was clear of the cone of light. Venus just above horizon in cone near S. end of base.

Observer: W. B. Housman						Zodiacal Light
No.	Date 1929	Time G.M.T.	Sun Rise	Sun Set	Apex Position	Report
3	09/08	03/20 to 03/40	05/33		G.	Sky cloudless, slight haze. Base from 23° to 56° AZ: Apex 25° Alt., but faint extension to G. Luminosity G=, in Auriga. Dawn estimated 03/40.
4	09/13	02/20 to 03/15	05/42		G.	Base at 03/15 vertically below Pollux at S. extremity. 40° wide. Luminosity from head of Leo to Praesepe = 2 to 3 G. Boundaries vague. Dawn seen 03/45.
5	09/16	02/40 to 03/50	05/47		—	Moonset 02/05. Dawn 03/50. Base 30°, S. end just N. of vertical line below Pollux = 2 G. Haze 3° deep along horizon.
6	10/11	04/10	06/33		—	Luminous sky, but Z.L. enhanced luminosity in Leo. Boundaries quite impossible. Dawn not sure till 04/40.
7	10/31	00/15	07/11			COUNTERGLOW. Invisible in a perfectly clear dark sky. The sky became luminous before dawn, and the Z.L. was invisible in the sky. Zodiacal Light and Galaxy entirely obliterated in a brightly luminous clear sky.
8	10/31	04/30 to 04/50				
9	11/08	05/00 to 05/30				
	1930					
10	01/25			16/40	Pisces.	Base 20° S. extremity 7° to S. side of vertical line from α Pegasi Boundaries vague. $=\frac{G}{2}$
11	02/15	19/30		17/22	Aries.	Base 30° S. extremity on vertical from α Arietis. Great Square of Pegasus just clear of the light cone. =3 G.
12	02/17	19/30		17/26		As above, but =G.
13	02/18	19/30		17/28		Ditto =2 to 3 G.
14	03/01	19/50		17/50		Base 30° =3 G.
15	03/29	20/40		18/43	Pleiades	=3 G. Comet seen in the cone of light.

Observer: F. C. Molesworth						Zodiacal Light
No.	Date 1929	Time G.M.T.	Sun Rise	Sun Set	Apex Position	Report
1	07/31	20/00		18/40	74° El.	Lat. 22°N. Long 37° E. at sea.
2	08/02	20/00		18/50	72° El.	,, 30°N. ,, 32° E. ,,
3	08/04	20/15		19/00	91½°El.	,, 34°N. ,, 26° E. ,,
4	08/05	21/15		19/00	69° El.	,, 36°N. ,, 10° E. ,,
5	09/25	20/00		18/00	—	,, 51°N. ,, 4° W. invisible in a clear sky.
6	09/26	20/00		18/00		Do.
7	09/27	20/00				Do.
8	10/27	18/30				Do.
	1930					
9	04/15	21/00				Visible; boundaries indistinct. 57° N., 3°W.

Observer: B. Brown						Zodiacal Light
No.	Date 1929	Time G.M.T.	Sun Rise	Sun Set	Apex Position	Report
1	09/09	02/10				Apex about 30° from H. along Ecliptic, rounded form. S. edge shown vertical = G.
2	12/03	05/30				Base 35°, Apex 30°, as above = G
	1930					
3	02/28					Base 35°, Apex 37½° from H. along Ecliptic below Pleiades. Rounded form > G.
4	03/24	20/30			30° from H.	Apex very rounded, 30° along
5	03/25	20/35			23°	Ecliptic from H, near Pleiades.
6	03/26	20/36			28°	Apex 28° as above < G. Bright sky interfered with this observation, also on several other dates when Z.L. could not be seen in clear sky for general luminosity. Notes are taken from observer's sketches.

Observer: Mr. R. L. Clarkson						Zodiacal Light
No.	Date 1930	Time G.M.T.	Sun Rise	Sun Set	Apex Position	Report
1	01/30	18/20 to 18/50				Sketch made shows Z.L. with pointed apex at γ Arietis and base about 0·7 of height. N. edge clear below square of Pegasus.

LUMINOUS NIGHT SKY.

The following is a record of all occasions when the night sky has shown luminosity either wholly or in part outside the normal Auroral limits, where Auroral flares, streamers or curtains have been absent, and where no movement perceptible to the eye has taken place.

The past season has been remarkable for these appearances, as the observations from Seaton and Oakley will show.

(1) 1929 *Oct.* 11. *Seaton.*

04/10. In a sky free from clouds the light was such that the Galaxy could only be traced with difficulty. The Zodiacal Light was only traceable due to the sky in that area being brighter still. Luminosity also appeared in the form of a segment centred 10° AZ. (N.b.E.) to 15° ALT., from Cygnus to the tail of Leo. The horizon in W. and S.E. was dark. Meteorological conditions repeated almost exactly those of 1922 Jan. 31st, when the finest example of this manifestation occurred that has been seen by this observer. A large amount of low cloud (sea mist or stratus) kept constantly sweeping over the sky from W., with mild warm air. One minute would find the sky entirely overcast, the next, cloudless and luminous. Dawn was 04/20, but was not detected till 04/40.

(2) 1929 *Nov.* 6. *Seaton.*

After a spell of cloudy weather both at Seaton and at Oakley the sky cleared at the former station on this date, and revealed a condition of beautiful luminosity which may have commenced before this date, and which was seen with varying brightness whenever clouds permitted until the full Moon period on 15th. The following notes were made on this date at Seaton:—

20/30. Horizon luminous from W. to E., 180°. Brighest region E. side of N. white light. 21/00. A faint luminous beam was formed, 3° wide, 10° AZ., 30° ALT. to head of Ursa Major from horizon. It was persistently stationary for 1½ hours, except that the upper end in Ursa occasionally extended by imperceptibly slow movement in a curved path to Auriga. (Beam A) 21/35, Luminous mist appeared in large areas of sky chiefly above N. horizon, much brighter than the Galaxy.

These luminous areas appeared in various places, and glowed at times with a faint crimson light that shone and waned again rapidly, exactly as occurs on a more splendid scale during an active Auroral display. A great curved beam (Beam B) formed at 330° AZ. from the horizon to the head stars of Ursa Major, where it joined Beam A, thus enclosing a large area of sky below, nearly all of which was luminous, and of greater brightness than the regions outside this area, which were luminous in places N. of the Galaxy. 21/30. Apex of this figure extended upwards towards Galaxy. 22/00. Very bright mass of glowing light from E. towards N., 30° dia., 30 ALT. to upper limit = 4 to 6 G. in brilliance. 22/30. E. light fainter, and now a very bright area 20° dia., 345° AZ., 20° ALT., to upper limit. At this time the whole sky N. of Galaxy, which passed overhead, was luminous, except close up to the Galaxy and in a few isolated dark patches. Faint parallel bars 2° to 3° wide with equal intervals lay in a N. and S. direction, and were stationary high in the N.E. for a long time. (In 1922 Jan. 31 they appeared E. and W. and were more brilliant.) 23/30. Luminosity massed very bright on N. horizon. After midnight the light continued, but was of less intensity. There was never any light on S. side of Galaxy. 02/00 (Nov. 7). Sky became overcast. At Oakley, Nov. 6 and 7, were overcast. At Seaton the clouds commencing 02/00 (Nov. 7) remained until Nov. 8, 05/00, when the sky cleared after a long rainstorm, and the following was recorded:—

(3) 1929 *Nov.* 8. *Seaton.*

05/00. Rainclouds dispersed first in N.W. area, and revealed a brilliant sky, estimated = $\frac{1}{2}$ Moonlight. Structural arrangement was seen in the form of broad bands disposed E.N.E.-W.S.W. direction. About seven such bands were noticed between Ursa Major and Leo. Patches of luminous mist were all over the sky, but near the horizon at E.-S.-W. it was dark. The Galaxy and the Zodiacal Light were both invisible when the sky became cloudless at 05/30. The horizon glow at 10° AZ rose to about 20° ALT. The Andromeda Nebula, which can be seen in quite strong Moonlight, was invisible at 20° ALT.

At 05/20 advertisement headings in "Whitaker's Almanac" could be read. Dawn was observed at 05/40.

(4) 1929 *Nov.* 8. *Seaton.*

22/30. Cloudy, but breaks N.W. and N.E. revealed a bright sky, especially in N.E.

(5) 1929 *Nov.* 8. *Oakley.*

A very bright northern sky was noticed at 22/00, to 23/00, after Moonset. No streamers, but a whitish luminosity from W. to nearly E., and up to Ursa Major. It was very light all night.

(6) 1929 *Nov.* 9. *Oakley.*

23/00. Sky unusually light in N.E. after Moonset.

(7) 1929 *Nov.* 10. *Oakley.*

03/00. Sky observed very light though heavily clouded.

(8) 1929 *Nov.* 11. *Seaton.*

First clearing from cloud since Nov. 8. At 01/30 a partial clearing revealed a light sky after Moonset.

(9) 1929 *Nov.* 14. *Seaton.*

Moonset before dawn. Sky was darker than of late, but too luminous for any observation of Zodiacal Light to be made.

(10) 1929 *Nov.* 26. *Oakley.*

23/00. Starry sky appeared light.

(11) 1929 *Nov.* 27. *Oakley.*

Cloudy all night, but from 21/00 the night became curiously light. Moonrise not till after 03/00.

(12) 1929 *Nov.* 30. *Oakley.*

01/00. Gaps in clouds revealed quite a light sky in N.

(13) 1929 *Nov.* 30. *Oakley.*

19/00. Similar gaps in clouds showed sky to be quite dark.

(14) 1929 *Dec.* 5. *Oakley.*

The sky appeared fairly light all night

(15) 1929 *Dec.* 6. *Oakley.*

Decidedly light sky as on Nov. 26.

(16) 1929 *Dec.* 25. *Oakley.*

Cloudy till 22/00, then quite clear. A bright glow in N. visible from 22/30 to 23/30. Silvery white in colour extending N.W. to N.N.E., and brightest just W. of N., where the Galaxy also touched horizon. 20° ALT. at brightest. Light gone 00/30.

(17) 1929 *Dec.* 29. *Oakley.*

Sky in N. bright from end of twilight onward, roughly from N.W. to N.E., and up to Ursa Major. No streamers, but variable while light. Faded about 22/00, but obvious again 02/00 (Dec. 30).

(18) 1930 *Jan.* 25. *Seaton.*

01/00. Sky observed to be luminous on clearing. Stars of 6th mag. seen with difficulty. No structure.

(19) 1930 *Jan.* 26. *Seaton.*

02/00. Sky generally luminous with concentration in Auroral area, but no streamers appeared. The Galaxy was hardly seen in a very clear sky.

(20) 1930 *Mar.* 24. *Oakley.*

21/30 to 22/30. Light northern sky close to horizon, like a white mist rising.

If these luminous skies are of Auroral origin they would seem to suggest that Auroral displays belong to two classes, those that are active with arches, and streamers in visible movement, and those that are quiescent with luminous clouds and bands of light that are either stationary or move exceedingly slowly.

From observations at Seaton since 1920, the former class invariably appear in the Magnetic North area, or to be centred in that direction, while the latter have almost as surely been seen brightest in the NNE.

W. B. HOUSMAN, *Director.*

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